

R E P O R T
ON THE
SANITARY CONDITION
OF
MERTHYR TYDFIL.

DRAWN UP AT THE REQUEST OF
THE LOCAL BOARD OF HEALTH,
AND READ AT THE MEETING OF THE BOARD,
ON THE 15TH DAY OF MAY, 1854,
BY THEIR TEMPORARY OFFICER OF HEALTH,
WILLIAM KAY, M.D.

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FORENSIC MEDICINE IN THE BRISTOL MEDICAL SCHOOL.

Published by the Local Board.

MERTHYR-TYDFIL:
PRINTED BY REES LEWIS, STATIONER, HIGH STREET.

E R R A T A .

Title-Page, for "Report of," read "Report on."

Page 2, line 1, dele "and."

„ 3, „ 29, for "two months," read "two or three months."

„ 4, „ 12, for "Cyfartha," read "Cyfarthfa."

„ 4, „ 37, for "on the right of the Taff," read "on the night of the 31st of March."

„ 7, table 4, foot of the 3rd column, for $611\frac{3}{7}$, read $611\frac{5}{7}$.

„ 8, „ 22, dele the commas after "under," and after "above," so that the sentence may read thus—"and the deaths above 5, and under and above 20 years of age, &c."

„ 10, „ 11, for "statist," read "statistician."

„ 15, table 8, last column, for "42. 6," read "52. 6."

„ 16, „ 18, for "June," read "March."

„ 35, „ 2, for "eanduct," read "conduct."

„ 59, „ 1, for "atmosphoric," read "atmospheric."

„ 59, „ 12, for "system," read "systems."

„ 59, „ 21, the sentence commeneing, "In all circumstances"—should read thus—"In all circumstances where it is practicable, (and there are few where it is not), the existing impediments to a current of air through such premises" &c.

„ 69, „ 9, for "Pedwranfach," read "Pedwaranfach."

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The numerous calculations occurring in this Report, and involving many thousand figures, having been made by the writer alone, and *unchecked*, it is more than probable that some errors will be detected; but not, it is believed, of a nature to interfere with the deductions, or to affect the general results. The reader, familiar with the labour of such statistics, will readily accord the necessary indulgence: and by others, who may honor these pages with a perusal, and who may be less versed in the difficulties of the task, a similar courtesy will hardly be withheld.---W. K.

R E P O R T , & c .

UNDER the general name, Merthyr-Tydfil, is comprised the town, properly so called, Pen-y-darran, intermediate between the two, and Dowlais ; and, including the numerous and somewhat scattered houses connected with the two latter, and the Cyfarthfa and Plymouth Iron Works, it occupies a valley of about three miles in extent, surrounded by a mountainous district, rich in iron and coal, intersected by the river Taff, and its tributary, the Morlais Brook. The source of the Taff is in the old red sandstone range of the Vans of Brecon, eight miles distant ; and that of the Morlais, in the hills rising immediately above Dowlais. From the sloping character of the ground, a very small portion only, at the lower extremity of the town, being upon the level, Merthyr, in point of situation, may be considered as “ open, airy, and well exposed to the sun.”

For registration purposes, it is divided into two districts—Upper and Lower ; the upper including Dowlais, standing from 1,000 to 1,200 feet above the level of the sea ; and the lower, Merthyr Proper, at the diminished elevation of 500 feet.

As regards site, therefore, and geological position, it cannot be otherwise regarded than as naturally salubrious ; the surrounding country presenting features by no means devoid of a bold and picturesque beauty. There is a sensible difference in the temperature of its two divisions, referable to the difference in their relative elevation ; but that of the whole, compared with other neighbouring localities on the coast, is low, and, from the hills around it collecting the vapours from the sea, proportionally more exposed to rain and damp.

The prevailing winds during eight or nine months of the year are from the S.W., and for two months from the N.E.

Notwithstanding the numerous furnaces in blast, and other fires, connected with the several works, and the large population of the town (46,378), the atmosphere is by no means smoky ; the coal employed, both in the works and for domestic purposes,

containing very little bituminous matter, and approaching in quality very closely to the character of Anthracite. Coke is likewise extensively used in the manufacture of iron.

Inhabitants.—The rise and history of the town, from a mere hamlet, to its present size and extent, cotemporary with the substitution of pit-coal for charcoal—the subsequent rapid increase, and present magnitude, of its iron and coal works—sufficiently explain the large numerical preponderance of the *working classes*, and the very limited number of persons occupying the middle and upper stations, in its local society.

The former, chiefly consist of the workmen and their families, employed in the respective establishments of the Cyfartha, Dowlais, Pen-y-darran and Plymouth works—the middle rank, of tradespeople, shopkeepers and others—and the upper, of the iron-masters, and of the professional gentlemen, clerical and lay, in the ordinary proportion incident to a populous community. But all are connected, either directly or otherwise, with the trade and commerce of the place.

There are few or no residents, who have made it their abode from choice, uninfluenced by pecuniary considerations, or family circumstances. This is a feature, if not peculiar to Merthyr, so marked and characteristic, that it cannot fail, upon a slight intercourse with its inhabitants, to strike the attention of a stranger. Nor will he be slow in discovering, that to this circumstance—the absence of persons of independent position, and unassociated with the local agencies and interests in operation—is to be attributed much of that stationary, *laissez faire* system, which for so long a period retarded its social and sanitary improvement. The observation is by no means made in a reproachful spirit, but, on the contrary, simply as the statement of a fact, with the view of accounting for a state of things, which, in this age of progress, would hardly admit of explanation upon any other grounds.

It is difficult, in the absence of actual data, to assign the precise proportion of the three classes enumerated to the general population.

According to the census of 1851, the number of persons in Merthyr, excluding Vaynor, on the right of the Taff, was 46,378; and, probably, we shall not greatly err if we set down 40,000, as representing that of the labouring class, and the re-

maining 6,000 and upwards, that of persons in the upper and middle ranks; and assign 4,000 of the latter to the lower division of the town, Merthyr Proper, and about 1,000 or 1,200, to Dowlais and the upper division. Domestic servants, as regards health, comfort, and social circumstances, occupying much the same position as the families with whom they live, are, in the above distribution, associated accordingly. It is important to keep in view this unusually large majority of the industrial class, in connection with the registration returns of the general mortality. And I am the more desirous that so marked a feature should, at the outset of our inquiry, hold its just place, from the circumstance of its having apparently escaped attention, or not received due consideration, in previous similar investigations. In all populous communities, sickness and mortality, it is well known, prevail to a greater extent amongst the labouring poor, than in the upper and better classes; the deaths of children, more especially, increasing the disparity. To lose sight, therefore, of a practical distinction, recognizable in all large towns, would be to vitiate mortuary calculations, and convey a false impression of sanitary condition in reference to any particular locality.

The following table shows the increase in the number of houses and inhabitants, at each decennial enumeration, during the last 50 years:—

TABLE I.

Years.	Inhabited Houses.	Males.	Females.	Total.	Decennial Increase.
1801	1404	4273	3432	7705	....
1811	....	....	....	11,104	44.1
1821	3052	9552	7852	17,404	56.7
1831	4365	11,840	10,243	22,083	26.2
1841	6616	19,068	15,909	34,977	58.3
1851	8354	24,728	21,650	46,378	32.5

The marked increase of the population in the two decennial periods, from 1811 to 1821, and 1831 to 1841, can hardly fail to attract attention.

In both instances, the impulse given to the iron trade by the sudden rise in the price of iron, and the consequent demand for

an increased number of workmen, supplied from the ranks of immigrants, furnish sufficient expletives.

Mortality.—In Mr. Rammell's, the Superintending Inspector's report, in the year 1850, a tabular statement is given of the number of births and deaths in each of the seven years, from 1841 to 1847; the arrangement of which, with additional columns, I have slightly varied; and introduced, for the purpose of comparison, a similar table of the Births and Deaths which occurred in the subsequent six years—1848 to 1853.

TABLE II.

Births and Deaths in Seven Years—1841 to 1847.

Years.	Births.	Deaths under 1 Year.	Deaths under 3 Years.	Deaths under 5 Years.	Total Deaths under 5 Years.	Above 5 yrs., & under 20 Years	Total under 20 Years	Above 20 Years.	Total Deaths.
1841	1483	247	253	54	554	86	640	334	974
1842	1531	228	160	36	424	68	492	289	781
1843	1574	226	140	37	403	91	494	316	810
1844	1600	360	382	135	877	143	1020	497	1517
1845	1694	309	216	65	590	130	720	362	1082
1846	1813	335	243	62	640	103	743	438	1181
1847	1759	385	310	93	788	139	927	507	1434
Total ..	11,454	2090	1704	482	4276	760	5036	2743	7779
Average per ann.	16,36 $\frac{2}{7}$	298 $\frac{4}{7}$	243 $\frac{3}{7}$	68 $\frac{6}{7}$	611 $\frac{9}{7}$	108 $\frac{4}{7}$	719 $\frac{3}{7}$	391 $\frac{6}{7}$	1111 $\frac{2}{7}$

The sudden increase in the deaths from an average of 855, in the three preceding years, to 1517, in 1844, and which our columns show were not confined to children, (the augmentation in the latter being from 468 to 877), challenges observation. In that year, as seen in the next table in Mr. Rammell's Report, Epidemic, Endemic and Contagious diseases prevailed to a great extent, and attended with proportionate fatality. The forms in which such affections were chiefly developed, were Small-pox, Scarlet Fever, and Measles; the deaths from Consumption and Fever being likewise more than ordinarily numerous.

This high rate of mortality, in one year, of course materially affects the mean result of the seven years, as we shall immediately have occasion to point out.

A mortality, in a still higher ratio, presents itself in the columns of the following table, in the year 1849; entailing events too recent and impressive to require any comment explanatory of their appalling cause.

The equalizing effect of such fatality, in each of the series of 7, and 6 years, upon the separate general results, will occur to the intelligent observer.

TABLE III.

Births and Deaths in Six Years—1848 to 1853.

Years.	Births.	Deaths under 1 Year.	Deaths under 3 Years.	Deaths under 5 Years.	Total Deaths under 5 Years.	Above 5 Yrs. & under 20 Years.	Total under 20 Years.	Above 20 Years.	Total Deaths.
1848	1785	288	207	66	561	95	656	430	1086
1849	1791	428	377	193	998	388	1386	1539	2925
1850	1857	323	226	104	653	143	796	442	1238
1851	2056	374	283	104	761	169	930	551	1481
1852	1904	391	328	91	810	148	958	493	1451
1853	2006	400	298	74	772	165	937	552	1489
Total ..	11,399	2204	1719	632	4555	1108	5663	4007	9670
Average per ann.	1899 $\frac{5}{6}$	367 $\frac{2}{3}$	286 $\frac{3}{4}$	105 $\frac{2}{5}$	759 $\frac{1}{5}$	184 $\frac{1}{5}$	943 $\frac{5}{6}$	667 $\frac{5}{6}$	1611 $\frac{1}{5}$

The following table renders the proportion of the Deaths of children, under 5 years, to the Births, each year, more clear, by an additional column, showing the per centages.

TABLE IV.

Deaths under 5 yrs. & Births, 1841-7. Deaths under 5 yrs. & Births, 1848-53.

Years.	Births.	Deaths under 5 Years.	Per cent.	Years.	Births.	Deaths under 5 Years.	Per cent.
1841	1483	554	37.3	1848	1785	561	31.4
1842	1531	424	27.6	1849	1791	998	55.6
1843	1574	403	25.6	1850	1857	653	35.1
1844	1600	877	54.8	1851	2056	761	37.0
1845	1694	590	34.8	1852	1904	810	42.5
1846	1813	640	35.3	1853	2006	772	38.4
1847	1759	788	44.8	....	....	....	....
Total ..	11,454	4276	37.3	Total ..	11,399	4555	39.9
Average per ann.	1636 $\frac{2}{7}$	611 $\frac{3}{7}$	37.3	Average per ann.	1899 $\frac{5}{6}$	759 $\frac{1}{5}$	39.9

The difference in the ratio of the Deaths to the Births, between the two periods of seven, and six years, is thus shown to be 2.6 per cent.—37.3 and 39.9; such result being unfavourable to the *later* period. The largely augmented mortality from Epidemic diseases, in 1844, nearly balances that from Cholera, in 1849—54.8, and 55.6; the difference being only 0.8. And it is interesting to remark, in both instances, the increase of Births in the two following years; amounting, in 1845, to 94, as compared with 42, (the average rate of increase for the three preceding years), and, in 1846, to 119. In 1850, to 66, as compared with 16, the average increase for the two previous years; and, in 1851, to 199; and, likewise, in both cases, the corresponding *decrease* in the subsequent years.

But there are more startling facts developed by these tables. In the *seven* years, from 1841 to 1847—11,454 children were born, and 4276 children, *under 5 years of age*, died—37.3 per cent.; or more than 7 in 20. And, in the *six* following years, from 1848 to 1853—11,399 children were born, and 4,555 children, *under 5 years of age*, died—39.9 per cent.—8 in 20—2 in 5! The naked figures tell their own appalling tale.

The next table shows the *proportionate* annual deaths of children under 1, 3, and 5 years; and the deaths above 5, and under, and above, 20 years of age, in each division of the parish; and the yearly marriages. As regards the latter, though arranged under Upper and Lower Merthyr, in accordance with the number that were actually solemnized in each year, it must not be supposed that they, by any means, represent the number of persons, *living* in the two divisions, who entered into such a connection; but merely the proportion who resorted to either the one or the other respectively, for such a purpose. The decided preference evinced for Lower Merthyr in the contraction of marriage, may be referred, probably, to local causes—its being the situation of the parish church, still, happily, venerated by many from family, and, it is to be hoped, religious associations; and, likewise, of the registrar's office, affording ample civil facilities for a similar change of state.

TABLE V.
UPPER MERTHYR (WITHOUT VAYNOR).
Deaths in Six Years—1848—53.

Years.	Mar- riages	Births	Under 1 year.	Under 3 years.	Under 5 years.	Total under 5 years.	Above 5 years, & under 20 years.	Total under 20 years.	Above 20 years.	Total Deaths.
1848	100	835	157	116	40	313	48	361	209	570
1849	107	893	236	216	113	565	233	798	946	1744
1850	191	888	153	131	59	343	78	421	221	642
1851	169	1021	189	156	59	404	99	503	260	763
1852	172	925	211	194	48	453	82	535	238	773
1853	244	1022	215	169	42	426	82	508	272	780
Total.	983	5534	1161	982	361	2504	622	3126	2146	5272
Average per ann.	163 $\frac{5}{6}$	930 $\frac{4}{6}$	193 $\frac{3}{6}$	163 $\frac{4}{6}$	60 $\frac{1}{6}$	417 $\frac{2}{6}$	103 $\frac{4}{6}$	521	367 $\frac{4}{6}$	878 $\frac{4}{6}$
Total without Cholera.	.....	.....	1110	919	297	2327	455	2790	1440	4233
Average per ann.	.....	.....	185	153 $\frac{1}{6}$	49 $\frac{3}{6}$	387 $\frac{5}{6}$	75 $\frac{5}{6}$	465	240	705 $\frac{3}{6}$
LOWER MERTHYR										
1848	407	950	131	91	26	248	47	295	221	516
1849	442	898	192	161	80	433	155	588	593	1181
1850	448	969	170	95	45	310	65	375	221	596
1851	399	1035	185	127	45	357	70	427	291	718
1852	452	979	180	134	43	357	66	423	255	678
1853	509	984	185	129	32	346	83	429	280	709
Total	2657	5815	1043	737	271	2051	486	2537	1861	4398
Average per ann.	442 $\frac{5}{6}$	969 $\frac{1}{6}$	173 $\frac{5}{6}$	122 $\frac{5}{6}$	45 $\frac{1}{6}$	341 $\frac{5}{6}$	81	422 $\frac{5}{6}$	310 $\frac{1}{6}$	733
Total without Cholera.	.....	.....	1021	691	229	1941	397	2339	1521	3860
Average per ann.	.....	.....	170 $\frac{1}{6}$	115 $\frac{1}{6}$	38 $\frac{1}{6}$	323 $\frac{3}{6}$	66 $\frac{1}{6}$	389 $\frac{5}{6}$	253 $\frac{3}{6}$	643 $\frac{3}{6}$

At the foot of these tables, separate “totals and averages,” it will be observed, are given, “with, and without cholera.” This latter term, “without,” is not, of course, intended to convey that the deaths which took place in the year of cholera, (1849), are wholly excluded, or that a distinction is made between the deaths from cholera, and those from ordinary diseases; but, simply, that the deaths in 1849, are *averaged*—calculated in the same ratio for that year as for the other five years. Sanitarily speaking, there was no call—no obligation—to *equalize* the mortality of the year in question; on the obvious ground, that *cholera*

is the direct result of sanitary neglect—the direct infliction and penalty entailed by dirt, filth, and impurity. It is not in itself a poison; its influence, *per se*, being comparatively harmless. It is only when attracted by local causes—noxious agencies—elements of malaria—within and around, that it becomes the malignant and deadly scourge which decimated your population in 1849. The frightful mortality, the excess of deaths, of that year, might fitly have been left to stand on the record, in all the startling and distinctive prominence of their numerical amount. Any qualification, therefore, must be viewed as a courteous concession on the part of the statist, in deference to popular, though unfounded, impressions.

The subsequent calculations of the mortality, being based upon these tables, it may be proper to explain, that, in the absence of accurate data, the last census enumeration in 1851, is assumed as correctly representing the *average* population for the last six years. Its increase during the two following years, 1852 and 1853, as we shall immediately have occasion to show, has, doubtless, been considerable; but, as the year 1851 occupies nearly a *central* position in the series, such increase, for which no credit is taken, may fairly stand as a set-off against the minor population of the three preceding years; and in this way, the whole series, it is believed, will be fairly equalized.*

The increase of the population in these six years (1848—53) can hardly have been less than 7000; seeing that, in 1841, it was 34,977, and in 1851, 46,378; being in the proportion of 1100 per annum.

Now, the births during the former period (1848—53) were 11,399, and the deaths 9670; leaving a balance of only 1729, as the addition, from *this source*, to the population. The difference, therefore, between 1729 and 7000, viz., 5271, must have been occasioned by *immigration*. Now, an accession of this character—that is, of persons in quest of employment, and, for the most part, therefore, arrived at years of maturity—is not that of a class tending to augment, but, on the contrary, directly to diminish, the ordinary ratio of mortality, and especially the

* “The numbers living in the *middle* of a short period, represent with sufficient accuracy the mean numbers living during the whole period.”—Fourth Report of the Registrar-General, p. 17.

relative mortality of children—to increase the deaths of adult persons, and proportionably favour those of a younger age. As this is an important point, we are anxious to make it clear. Perhaps it will become more so by putting it in a different form.

In the six years, 11,399 children were born—that is, 1899, on an average, in each year—who might, and were, relatively, more likely to die, on account of their tender age. During the same period, 5271 persons, no longer children, but of mature age, and, consequently, less liable to die—whose chances of life were greater—settled in Merthyr, and became, for the time being, a constituent part of its population. Now, it will be obvious, that whatever number of these latter actually died, their deaths were recorded amongst those of the older lives, and numerically increased the general mortality—the standard with which the deaths of children have to be compared. “Yet, in spite of this circumstance,” to use the language of Mr. Rammell, “the astounding fact appears upon the face of the above returns,” that, of the whole average mortality of the last six years, out of 1349 deaths, 711, or more than *one-half*, were those of children under 5 years of age; and 855, or very nearly *two-thirds*, of persons under 20 years of age. Of the 11,399 children born in the last six years, 2131, being more than *one-sixth*, died before the end of the first year; and 4268, or more than *one-third*, before they attained 5 years of age.

But the difference in the results, in the two divisions of the parish, is sufficiently remarkable. We alluded, just now, to the increase to the population derived from the excess of the births over the deaths; and we found this to be 1729 in the six years. Now, of this number, only 312, or $\frac{1}{5}$ per annum—little more than *one-sixth*—were from the Upper division; and 1417, or $\frac{2}{3}$ per annum—nearly *five-sixths*—from the Lower division; the births, in the former, being 5584, and the deaths 5272; and those in the Lower, 5815 and 4398—the births 231 more, and the deaths 874 less, though the populations of the two are nearly the same—23,231 and 23,147. The greater fatality of cholera, in the one than in the other, will, in some measure, explain the disparity; cholera proving fatal to more than double the number of persons in the Upper than in the Lower division; the deaths in the former being 935, and in the latter, 454. If we deduct the difference,

481, from the total deaths, 5584, in the Upper, they will be reduced to 4792; and the further abstraction of the 231 majority of *births*, in the Lower division, will give the figures 4561, and thus nearly assimilate the two. This, we are of course aware, is not a legitimate process, and is only accounting numerically for a difference, the occasion of which must ultimately be referred to *sanitary* causes. For, setting aside the greater malignancy which they, or, more correctly speaking, noxious influences, imparted to the visitation of cholera in the year in question—upon examining the general mortality of children, as recorded in the columns, under 1, 3, and 5 years of age, in any of the other five years, from 1848 to 1853, it will be found invariably higher in the Upper than in the Lower division; and equally so the deaths above 5, and under 20 years, with one single exception (if exception it can be called) in the year 1853, the numbers being relatively 82, and 83. Above this age—that is, above 20 years—the comparison is slightly in *favour* of the Upper Division, in four years out of the five; an advantage, as the respective totals of the columns show, quadruply neutralized by the surplus mortality of the one year from cholera. Now, this uniformity of result can only be attributed to causes equally uniform in their operation; not omitting to rank amongst the number, the *larger proportion of the labouring class* in the population of Upper Merthyr. But the *stress* of the infant mortality of Merthyr, we shall find, is under *one*, and under *three* years. Thus, the *average annual* births in Upper Merthyr being $930\frac{4}{5}$, and in Lower Merthyr $969\frac{1}{5}$, that of the two will be 1900; and *averaging* the deaths of children in the same way, those, under 1 year, will be 367; under 3 years, 286; and under 5 years, 105; or, thrown into a tabular form—

TABLE VI.

Annual Births.	Deaths.	Per cent. of Births.
1900	367	= 19.3 under 1 year.
	286	= 15.0 under 3 years.
	105	= 5.5 under 5 years.
Total...	<u>758</u>	<u>39.8</u>

Taking the two Divisions separately—

Annual Births.	Deaths.	Per cent. of Births.
UPPER, 930	193	= 20.7 under 1 year.
	163	= 17.5 under 3 years.
	60	= 6.4 under 5 years.
Total...	<u>416</u>	<u>44.6</u>

Annual Births.	Deaths.	Per cent. of Births.
LOWER, 969	174	= 17.9 under 1 year.
	123	= 12.6 under 3 years.
	45	= 4.6 under 5 years.
Total...	<u>342</u>	<u>35.1</u>

Upper.	Lower.
<u>44.6</u>	<u>35.1</u> = 9.5 per cent. difference.

	Upper.		Lower.
Under 1 year	20.7	.....	17.9 = 2.8
„ 3 yrs.	17.5	.....	12.6 = 4.9
„ 5 yrs.	6.4	.....	4.6 = 1.8

9.5 per cent. difference.

The uniformly higher ratio of infant mortality, to which we just adverted, as characterising the Upper Division, is here distinctly brought out, and still more strikingly, in the details exhibited by the following tables :—

TABLE VII.

Proportion of Deaths, under 1, 3, and 5 Years, to Births.

UPPER.				LOWER.		
Years.	Births.	Deaths under 1 Year.	Per cent. of Births.	Births.	Deaths under 1 Year.	Per cent. of Births.
1848	835	157	18.8	950	131	13.8
1849	893	236	26.4	898	192	21.3
1850	888	153	17.2	969	170	17.5
1851	1021	189	18.5	1035	185	17.8
1852	925	211	21.7	979	180	18.3
1853	1022	215	21.0	984	185	18.8
Total	5584	1161	20.7	5815	1043	17.9

Total	Deaths under 3 Years.	Per cent. of Births.	Deaths under 3 Years.	Per cent. of Births.
	116	13.8	91	9.5
	216	24.1	161	17.9
	131	14.6	95	9.8
	156	15.2	127	12.2
	194	20.9	134	13.6
	169	16.5	129	13.1
	982	17.5	737	12.6
Total	Deaths under 5 Years.	Per cent. of Births.	Deaths under 5 Years.	Per cent. of Births.
	40	4.7	26	2.7
	113	12.6	80	8.9
	59	6.6	45	4.6
	59	5.7	45	4.3
	48	5.1	43	4.3
	42	4.1	32	3.2
	361	6.4	271	4.6

TABLE VIII.

Proportion of Deaths under 5 Years to Total Deaths.

UPPER.				LOWER.		
Years.	Deaths.	Deaths under 5 Years.	Per cent. of Total Deaths.	Deaths.	Deaths under 5 Years.	Per cent. of Total Deaths.
1848	570	313	54.9	516	248	48.0
1849	1744	565	32.4	1181	433	36.6
1850	642	343	53.4	596	310	52.0
1851	763	404	52.9	718	357	49.7
1852	773	453	58.6	678	357	42.6
1853	780	426	54.6	709	346	48.8
Total	5272	2504	47.4	4398	2051	46.6

The more favourable position of the Lower over the Upper Division of the parish is still slightly maintained, even as the figures now stand; the proportion of deaths under 5 years of age to the deaths at all ages being as 46.6 to 47.4—a difference of 0.8.

But the general per centages for the six years, as *thus* stated in the totals, would mislead: they do not, as the eye will readily detect for itself, in glancing down the columns, correctly represent the *average* mortality of children; for, with the exception of the year 1849, the per centages in both Divisions range much higher. The deaths of persons *above 5 years*, from cholera, greatly exceeded those *below that age*, and, consequently, proportionably *reduced* the relative per centage opposite *that year*, as shown by the figures, 32.4 and 36.6. Keeping in view the explanation on this point formerly given, the following figures will be a more true exponent of the *ordinary* mortality of children in relation to the *ordinary general* mortality.

TABLE IX.

	Total Deaths.	Deaths under 5 Years.	Per cent. of Total Deaths.	Deaths under 5 Years to Total Deaths.
Upper	4233	2327	54.9	549 in 1000
Lower	3860	1941	50.2	502 in 1000
Total	8093	4268	52.6	527 in 1000

More than half of the funerals that take place in Merthyr are those of *children under 5 years of age*; and more than *one-fourth of infants under 1 year*—(8093 : 2131 :: 100 = 26.3 per cent.)!

In the metropolis, and four of the larger provincial towns, the following are the proportionate number of deaths below the age of 5 years, to 1000 total deaths:—

Metropolis	408
Leeds	480
Birmingham	482
Manchester	510
Liverpool.....	528

Merthyr thus competing for notoriety with the highest number in the list, opposite to the worst sanitary town in the kingdom, Liverpool!

The next table shows the number of children under 5 years of age, *living* in 1851, and *dying* in 1852; and may, therefore, be considered as decisive in its indications.

TABLE X.

	Living under 5 years, 1851.	Died under 5 years, 1852.	Per cent.	Proportion.
Upper	3321	453	13.6	1 in 7.3
Lower	3251	357	10.9	1 in 9.1
Total	6572	810	12.3	1 in 8.1

But, as the census was taken in *June*, 1851, we will add 1400 for the presumed increase of the population in 1852; and, therefore, if the former population showed the proportion of children under 5 years of age to be 6572—1400 will give a proportion of 176 additional, and raise the number of children, living in 1852, to 6748; and the last line of our table will stand thus: 6748—810—12.0—1 in 8.3. Compared even with the *worst* district in Bristol, the contrast is highly unfavourable to Merthyr: 2980—286—9.5—1 in 10.4. Had the deaths been in the same ratio as in St. Philip, Bristol, only 630 children would have died—180 less than actually died—and that in the space of *one year*! In the whole of England, the mortality of children under 5 years of

age, to the population living under that age, was 6.3 per cent—1 in 16—427, instead of 810.

TABLE XI.

Proportion of Deaths in 6 Years to Population.

Merthyr.	Population.	Average annual Deaths.	With Cholera per 1000.	Average annual Deaths.	Without Cholera per 1000.
Upper	23,231	878	37.7	705	30.3
Lower	23,147	733	31.6	643	27.7
Total	46,378	1611	34.7	1348	29.0

In this table, the last census enumeration of 1851 is assumed as correctly representing the *average* population for the six years, 1848—53, on the grounds stated at p. 10; and it thus appears that the average mortality for that period has been 34.7 per 1000, with cholera, and 29.0 per 1000, without cholera. But, we may take the *census year itself*, and it will present us with the following results:—

TABLE XII.

Merthyr.	Population.	Deaths.	per 1000.
Upper	23,231	763	32.8
Lower	23,147	718	31.0
Total	46,378	1481	31.9

—showing a mortality of 31.9 per 1000—nearly 3 per cent. (2.9) beyond that of the six years.

The increase of the population in the decennial period—1831—41, was at the rate of 1289 per annum; and, in the next ten years, 1841—51, 1140 per annum. In estimating the addition for the two following years, 1852 and 1853, at 1400 respectively, we shall, certainly, be calculating it at its full amount; and the populations and deaths will stand thus:

TABLE XIII.

Years.	Population.	Deaths.	per 1000.
1852	47,778	1451	32.4
1853	49,178	1489	30.2

The mean between the two, 31.3, exceeding, by 2.3 per 1000, the average mortality for the last six years. The *present* mortality of Merthyr cannot, therefore, be less, and is, probably, more, than 30 in 1000 of the actual population.

This must necessarily be regarded as a very unfavourable position of vital statistics.

Moreover, the returns, generally, indicate an *increase* in the number of deaths *upon preceding years*. In the five years, 1836—41, Sir Henry T. de la Beche estimates the mortality at 26 in the 1000; and Mr. Rammell, for the seven years, 1841—47, gives the proportion as 28.9 in the 1000.

Our own calculations exhibit a ratio of 29, for the last six years, *exclusive of cholera*, and of 31.5 for the last three years, 1851—53. Had the *whole* number of deaths in 1849 been *retained*, instead of being *averaged*, the proportion, as shown in Table XI., would have been 34.7 in 1000. In Mr. Rammell's report, the deaths in 1844, a year of similar excessive mortality, (38.8 in the 1000), are suffered to remain, (and most correctly) and form a component and unqualified portion of the general computation.

Had this been done in reference to the deaths in 1849—and, as we have already observed, there was nothing, sanitarily considered, to prevent it—the relative mortality between the seven years, 1841—47, and the six years, 1848—53, would have been 28.9, and 34.7, in 1000.

“An extensive investigation of the mortality,” says the Registrar-General, “in all the statistical districts of the kingdom, has shown that *less than 2 per cent.* of the population die in a great number of the country districts;” and that *2 per cent.* may, therefore, be considered as “the mortality in districts of an *average degree of salubrity*.” The healthy—the attainable standard of mortality—is, then, 2 per cent.—20 in 1000—1 in 50 of the

population. Now, the average mortality for the last six years in Merthyr Tydfil has been 29 in 1000, without cholera, and 34.7 with cholera; 1 in 34.3, and 1 in 28.8, respectively.*

This, we repeat, is an alarming state of vital statistics, entailing, *annually*, an *excess* of 9 *deaths* in 1000; a loss of 417 lives every year—of 2505 lives in the last six years, *exclusive* of the 1400 victims of cholera. And if to this fearful sacrifice of human life, we add sixteen times the amount of non-mortal cases of sickness, with their attendant discomfort, pain, and suffering, what a dark and distressing picture is presented to our contemplation!

The nature of the *Occupations* in which the labouring classes of Merthyr are so generally engaged—the iron manufactories, mines, and collieries—must necessarily, it has been supposed, render them liable to numerous *casualties*, frequently attended with fatal results, which thus swell the lists of mortality.

This supposition is at once met by the following returns of deaths from *accidental* causes, in which are included those arising from violence and suicide. They amount, it will be seen, to 299 in the six years, or 50 ($49\frac{5}{6}$) per annum—1.07 in 1000 of the population: a large proportion, undoubtedly, in the abstract, and, scarcely less certainly, admitting of diminution by the adoption of more careful and precautionary arrangements.

* In 1841, (the census year) the proportion of deaths to the population, was 1 in 37. In 1851, 1 in 31; and, in the six years, 1848-53, 1 in 28.8.

TABLE XIV.

Deaths from Accidents, Suicide, and Violence.

	UPPER MERTHYR.						Total in 6 Years	LOWER MERTHYR.						Total in 6 Years	Mertyr Total.
	1848	1849	1850	1851	1852	1853		1848	1849	1850	1851	1852	1853		
Years..	1848	1849	1850	1851	1852	1853		1848	1849	1850	1851	1852	1853		
Burning	4	4	4	6	6	4	28	0	3	5	6	2	2	18	46
Drowning	0	0	0	1	0	0	1	4	4	2	4	4	6	24	25
Fire-Damp.....	0	2	0	0	1	0	3	0	1	1	3	0	4	9	12
Machinery	4	1	3	1	2	3	14	0	0	0	0	3	2	5	19
Mining	1	9	8	6	4	2	30	7	17	14	24	17	15	94	124
Railway.....	0	1	0	1	3	4	9	1	1	1	4	1	1	9	18
Other Causes.....	4	1	2	2	1	3	13	6	2	5	6	3	9	31	44
Suicide { Hanging Drowning }	1 ..	.. 0	.. 0	.. 1	1 ..	1 0	3 1	2 ..	.. 1	.. 1	.. 0	.. 1	1 0	3 3	6 4
Violence.....	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1
Totals	14	18	17	19	18	17	103	20	29	29	47	31	40	196	299

In saying that they do not materially affect the ratio of the general mortality, let it not, for a moment, be supposed that we mean to represent the continuous loss of *nearly one life per week*, from casualties, as a light matter; or that we regard *fifty deaths*

in the year, as a legitimate proportion, inevitable and inseparable from the nature of the occupations in which the great body of your labouring classes are engaged.

On the contrary, whilst admitting that operations upon an enormous scale, in connection with mining and machinery, necessarily increase the chances of such occurrences, we shall with difficulty be persuaded that, if those precautionary arrangements and appliances, which science has supplied, and the adoption of which humanity dictates, were more rigidly enforced, and greater general care and vigilance scrupulously observed in all the departments of work—their number might not be considerably reduced.

The diminution in the relative proportion of casualties, in the last six, as compared with the preceding seven, years, from $50\frac{2}{7}$, to $49\frac{5}{6}$, per annum, notwithstanding the large increase in the works above and under ground, and, consequently, in the number of men employed—would appear to warrant such an assumption. With our notes before us of *some* of the causes of *mining* accidents, and which we cared not to particularize in the Table, the suppression of all remark upon a matter connected with *preventive* measures, would have been equally a violation of conscience and duty; and if the preservation of a single life be the result of inviting attention to the subject, the suggestion and the suggestor will be alike forgiven.

The two Divisions of the parish present marked differences in the relative number of deaths from certain causes. From Burn-
ing, 28, in the Upper, and 18, in the Lower. The occurrence of only *one* death from Drowning, in Dowlais, &c., explains itself; the absence, namely, of ponds, or other bodies of water. *Twenty-four*, in Merthyr, testify to the greater liability to the sacrifice of life by drowning, from the existence of the canal, the mill-pond or race, the river Taff, and the Morlais Brook.

Nine deaths from Fire-Damp, in the same division, as compared with *three*, in the other, may, probably, in some degree, be referred to the larger number, and *greater depth*, of the mining operations carried on in Lower Merthyr; rendering the ventilation more expensive, and, possibly, more difficult.

Thirty, and *ninety-four*, fatal casualties from *Mining*, would appear to be a disproportion, which the relative circumstances of

the two Divisions will hardly explain satisfactorily. It is gratifying to record only *one* death from *violence*, in the six years. We have no data at hand to guide us in offering an opinion respecting the proportion of *suicidal* acts. Regular and remunerative employment ought to impose a salutary restraint upon their commission; and we are inclined to regard *ten* as relatively a small number.

Our investigations have hitherto been directed to the illustration of the sanitary condition of Merthyr, as shown by the mortality of its *infant* and *adult* population; and the result, in both instances, has been to place it in a very low and unfavourable position in the sanitary scale.

The number of deaths occurring at an *advanced age*—the attainment of longevity by the few, or the many—affords an additional criterion by which the healthy or unhealthy character of a district may fairly be inferred. This test, however, must be regarded as furnishing the approximate, rather than the absolute, truth. For, it by no means follows, (especially in reference to your own town), that persons dying at ‘three score years and ten,’ in a particular locality, attained even longevity, much less that they resided during the whole period of their lives, in such locality.

The Table given at page 9, does not supply the materials necessary for the illustration in question; its headings being confined to the deaths *under 5*, *under 20*, and *above 20 years of age*, without specifying the particular ages—these being the only ones introduced in a similar table occurring in Mr. Ram-mell’s report, with which it was intended to afford the means of comparison—nor was it contemplated, at the time of drawing it up, entering upon the more extended calculations, which the nature of the enquiry, in the course of its prosecution, subsequently suggested.

Before introducing a separate table for the purpose, it is important to keep in view, that any comparison between the relative proportion of deaths, either of the young or old, at a *particular age*, and the *total deaths*, must necessarily yield conclusions, by no means absolute or decisive of healthiness or the reverse, unless the comparison be extended to the number of persons ascertained

to have been *living* at a given age, *and the total population*. The point is somewhat abstruse, and not easily seized, perhaps, at first sight.

The following table, and tabular arrangements may tend to render it more clear.

TABLE XV.

Deaths at 70 Years and upwards, in the Six Years, 1848—53.

Years.	Upper Merthyr	Lower Merthyr	Total.
1848	21	42	63
1849	77	73	150
1850	27	44	71
1851	35	48	83
1852	33	43	76
1853	39	63	102
Totals	232	313	545
Average per ann.	$38\frac{4}{5}$	$52\frac{1}{5}$	$90\frac{5}{6}$

The average number of deaths of aged persons, per annum, is thus shown to have been, $38\frac{4}{5}$, in the Upper, and $52\frac{1}{5}$, in the Lower Division—91, ($90\frac{5}{6}$) in Merthyr.

Upon comparing these with the average deaths at all ages—

TABLE XVI.

Merthyr	Average annual Deaths.	Deaths at 70 Years, & upwards.	Proportion.	Per cent.	Per 1000.
Upper	879	38	1 in 23.1	4.2	43
Lower	733	52	1 in 14.0	7.0	70
Totals	1612	90	1 in 17.9	5.5	55

—the deaths at 70 years, &c., give a proportion of 1 in 23.1, and 1 in 14.0—or, 43, and 70, in 1000, of the total deaths.

By thus *limiting* the comparison, (which is the course ordinarily pursued) an exaggerated, and, as we remarked, at the opening of our illustration, a deceptive, result is obtained, and

the sanitary inference rendered proportionably erroneous. For, judging from these figures, 43 and 70, *alone*, we should be led to conclude that Lower Merthyr was nearly twice as healthy as Upper Merthyr; or, more correctly, nearly twice as favourable to the attainment of longevity.

Let us supply the corrective by extending our comparison to the number of persons *living* at 70 years, &c., relatively to the *population*, (See Table XXIV.),—

TABLE XVII.

Merthyr	Population.	Living at 70 Years, & upwards.	Proportion.	Per cent.	Per 1000.
Upper	23,231	299	1 in 77.6	1.20	12.0
Lower	23,147	384	1 in 60.2	1.65	16.5
Totals	46,378	683	1 in 67.9	1.47	14.7

—and we have a proportion of 1 in 77.6, and 1 in 60.2, of the respective populations—or, 12, and 16½, in 1000.

With such a disparity in the numbers *living*, it would be unreasonable to expect that the number of old persons *dying*, should be equal in the two divisions; and, consequently, we find, that they were as follows:—

TABLE XVIII.

Merthyr	Living at 70, &c.	Died at 70, &c.	Proportion.	Per cent.	Per 1000.
Upper	299	38	1 in 7.8	12.7	127
Lower	384	52	1 in 7.3	13.5	135
Totals	683	90	1 in 7.5	13.1	131

—38 deaths, in the Upper, and 52, in the Lower; or 1 in 7.8, and 1 in 7.3—127, and 135, in 1000; the *mortality* to the numbers *living*, being thus nearly in the same ratio—(38, and 48, or, 40 and 52, representing the *actual* ratio) and closely assimilating,

therefore, the sanitary position of the two Divisions, as deduced from the *relative mortality* of the aged *living*. And the correctness of this position is further confirmed by comparing the *deaths* at 70, &c., with the *population*.

TABLE XIX.

Merthyr.	Population	Total Deaths at 70, &c.	Proportion.	Per cent.	Per 1000.
Upper.	23,231	232	1 in 100.1	0.99	9.98
Lower.	23,147	313	1 in 73.9	1.35	13.52
Totals.	46,378	545	1 in 85.0	1.17	11.75

1 death in 100, and 1 in 74, (73.9) of the population of the two divisions, or 10, (9.98) and $13\frac{1}{2}$, in 1000, show almost precisely the same relative proportions as those furnished by Table 9—12, and $16\frac{1}{2}$ —

thus— $12 : 16\frac{1}{2} :: 10 = 13\frac{3}{4}$ —or, $13\frac{1}{2} : 10 :: 16\frac{1}{2} = 12\frac{1}{4}$ ($\frac{97}{8}$).

As the results of the late census are not yet published, we have no means of comparing this proportion of aged persons living in Merthyr, with that of other towns; but in Bristol—in physical condition, the third worst town in the kingdom—there were living, in 1841, 1730 persons, of the age of 70 years and upwards, in a population of 64,279.

TABLE XX.

	Population	Living at 70 years & upwards.	Proportion
Bristol...	64,279	1730	1 in 37

To have been even in the *same* proportion as Bristol, there should have been living in Upper Merthyr, 625, and in Lower, 622, persons—a difference, in the one case, of 324, and in the other, of 238—together, 562—1247, instead of 685.

The disparity in relation to the districts composing the Clifton Union, consisting of two rural, three semi-rural, and one town district, is still more striking. They are arranged in the following table, in the order described.

TABLE XXI.

Districts.	Population	Living at 70 years & upwards.	Proportion.
Stapleton ..	7851	324	1 in 24.0
Westbury ..	7086	209	1 in 33.9
Clifton	14177	435	1 in 32.5
Ashley	6759	165	1 in 40.9
St. George..	8305	177	1 in 46.9
St. Philip ..	21590	453	1 in 47.6
Total..	65,768	1763	1 in 37.3

In two of these districts, there are asylums for the “*aged and infirm*”—their inmates being, of course, enumerated in the census of 1841, as *living* in the districts in which these asylums are situated.

In Stapleton, a rural district, the proportion of aged persons was 324—1 in 24. In Westbury, likewise rural, 1 in 34. In the semi-rural district of Clifton, 1 in 32; and in St. Philip, one of the worst, if not the worst, town district in Bristol, 1 in 47—453 aged persons, in a population of 21,590. Had there been only the *same* proportion living in St. Philip, as were living in Merthyr, instead of 453, the number of aged persons in the former would have been only 316; or, *vice versa*—had there been an *equal* proportion to the population living in Merthyr, the number of aged persons in the latter, instead of 683, would have been 973—a relative difference of 288—and the comparison is drawn between *one of the worst town districts*, in the *third worst city in the kingdom*, and your own community!

Had there been more *children* living in Merthyr, than in St. Philip, Bristol, this circumstance might, in some degree, have explained the disparity in the relative proportion of *aged persons* living in the two localities; but this was not the case. In St. Philip, in a population of 21,590, the number of children, under 5 years of age, was 2980. In Merthyr, in a population of 46,378, there were 6572 children living under 5 years of age; the *relative* difference being only 172.

The next table is introduced for purposes of contrast; and presents us with the *general* mortality, and the separate mortality of *children* and *aged persons*, for the years, 1838—44, in the whole of South Wales.

TABLE XXII.—Population and Mortality, and Deaths of Children and Aged Persons in South Wales, in the Seven Years, 1838—44.

TOWNS.	1841. Popula- tion.	Total Deaths in 7 Years.	Average annual Mortality.	Annual Mortality per cent. of Population	Propor- tion. Population	Popula- tion under 5 Years.	Propor- tion to Popula- tion.	Total Deaths under 5 Years.	Annual Deaths under 5 Years.	Percent. of Population under 5 yrs	Population & upwards at 65 yrs.	Propor- tion to Popula- tion.	Total deaths at 65 yrs. & upw.	Annual deaths at 65 yrs. & upw.	Percent. of Population at 65 years & upwards
Tregaron	40,982	4716	674	1.6	1 in 60.8	5354	1 in 7.6	1212	173	3.2	2339	1 in 17.5	1361	194	8.2
Lampeter.....															
Newcastle-in-Emlyn															
Builth															
Brecknock	55,420	8782	1254	2.2	1 in 44.1	6835	1 in 8.1	3177	454	6.6	3189	1 in 17.3	2032	290	9.0
Crickhowel															
Hay															
Haverfordwest	37,139	4492	642	1.7	1 in 57.8	4848	1 in 7.6	1306	186	3.8	2306	1 in 16.1	1316	188	8.1
Cardigan	32,778	4156	594	1.8	1 in 55.1	4349	1 in 7.5	1209	173	3.9	2095	1 in 15.6	1132	162	7.7
Aberayron	22,242	2644	378	1.7	1 in 58.8	2965	1 in 7.5	819	117	3.9	1195	1 in 18.6	662	94	7.8
Aberystwith															
Narbeth	41,418	5022	717	1.7	1 in 57.7	5611	1 in 7.3	1440	206	3.6	2377	1 in 17.4	1355	193	8.1
Pembroke															
Carmarthen.....	37,523	5067	724	1.9	1 in 51.8	4889	1 in 7.6	1501	214	4.3	2314	1 in 16.2	1358	194	8.3
Swansea	38,649	4611	659	1.7	1 in 58.6	5431	1 in 7.1	1675	239	4.4	1720	1 in 22.4	934	133	7.7
Llanelli															
Llandilofawr	52,036	7064	1009	1.9	1 in 51.5	7264	1 in 7.1	2304	329	4.5	2934	1 in 17.7	1714	245	8.3
Llandoverly															
Presteign															
Knighon	31,776	4137	591	1.8	1 in 53.7	4044	1 in 7.8	1277	182	4.5	1868	1 in 17.0	1159	165	8.8
Rhyader															
Monmouth	41,272	5652	807	1.9	1 in 51.1	5242	1 in 7.8	1771	253	4.8	2271	1 in 18.1	1400	200	8.8
Chepstow															
Cardiff	86,538	11,809	1687	1.9	1 in 51.2	11,865	1 in 7.2	4482	640	5.3	4187	1 in 20.6	2426	346	8.2
Bridgeend															
Neath															
Newport	33,057	5116	732	2.2	1 in 45.1	4525	1 in 7.3	2157	308	6.8	1305	1 in 25.3	717	102	7.3
Abergavenny	75,883	12,648	1807	2.3	1 in 41.9	10,648	1 in 7.1	6276	897	8.4	2306	1 in 32.9	1469	210	9.1
Pontypool															
Merthyr-Tydfil	52,863	10,030	1433	2.7	1 in 36.8	7312	1 in 7.2	5381	769	10.5	1511	1 in 34.9	914	130	8.6
Newcastle-on-Tyne ..	71,841	13,273	1896	2.6	1 in 37.8	9442	1 in 7.6	6127	875	9.2	2402	1 in 29.9	1855	265	11.0
Liverpool.....	223,003	52,563	7509	3.3	1 in 29.6	28,942	1 in 7.7	27,485	3926	13.5	4911	1 in 45.4	4412	630	12.8
Manchester	192,403	44,054	6298	3.2	1 in 30.5	24,917	1 in 7.7	22,531	3219	12.9	4785	1 in 40.2	3946	564	11.7
Bristol	64,266	13,094	1870	2.9	1 in 34.3	7361	1 in 8.7	5160	737	10.0	2684	1 in 23.9	2123	303	11.2

The mortality of Merthyr-Tydfil, including Vaynor, &c., greatly exceeds, it will be observed, that of all the other districts; being in the ratio of 27 in 1000 of the population. Abergavenny and Pontypool stand next in the list—23; then Brecon, &c., 22; Newport, 22; the others varying from 16 to 19, in 1000. A rude average of the whole (Merthyr excepted) shows a ratio of 19 in 1000. It is thus apparent that an excess of *eight deaths* in every 1000 inhabitants—422 yearly, or, 2954 in the seven years—occurred in Merthyr Union, over and above the average mortality of the whole of South Wales. A mortality of 2 per cent.—20 in 1000—we had occasion to explain, may be considered “the mortality in districts of an *average* degree of salubrity;” and our table shows that, three districts excepted, this healthy standard was more than attained in the remaining eleven.

We do not lose sight of the relative, and, in some respects, distinctive features characterising your own community; to these we have repeatedly adverted. But, making every fair allowance for such peculiarities, there will remain a large surplusage of deaths, which can only be accounted for by its hygienic condition—directly attributable to *local and preventible physical causes*—which sanitary measures are capable of controlling, or of altogether removing.

There are four large English towns introduced, at the foot of the list, two of which exceed Merthyr in general mortality—the deaths in Manchester being 32, and in Liverpool, 33, in 1000 of their inhabitants. But these towns having the unenviable reputation of being the *worst* sanitarily conditioned in the kingdom, there is not much ground for gratulation in Merthyr not occupying quite so bad a position; especially, when the larger figures representing *their* dense populations—*hundreds* of thousands instead of *tens*—are taken into the account; and their smoky atmospheres contrasted with your own, in this respect, purer element.

We proceed, in our comparison, with the Infant mortality. Where the *general* deaths are numerous, those of *children* will almost invariably be found to present a high ratio. It is the infant mortality, in truth, which swells the amount of the general deaths. And stronger evidence than this very fact—coupled with the character of the districts in which it is most prominent

—that such excess of deaths is dependent upon *local physical causes*, it would be difficult to adduce.

Returning to our table :—of all the districts in South Wales, that of Merthyr shows much the highest rate of Infant mortality—10.5 per cent. of the population—the nearest to it being that of Abergavenny and Pontypool—8.4 per cent.; the next in the scale, Newport, 6.8, and Brecon, &c., 6.6 per cent.; then, Cardiff, Bridgend, &c., 5.3 per cent.; the mortality in the last, being scarcely more than *half* that of Merthyr (10.5 per cent.) And it is not that an equal number of children, relatively to the population, were not *living* in Cardiff, &c., as were *living* in Merthyr, relatively to *its* population; for they were *both* in the proportion of 1 in 7.2. Numerically, therefore, they stood the same chance of *dying* in an equal ratio.

But the *actual* mortality was very different—in Cardiff, &c., 5.3 per cent., and in Merthyr, 10.5 per cent. of the population under 5 years; or, 53 in 1000, in the one case, and 105, in the other—double, within 1. Let us compare it with Haverfordwest: population, 37,139—deaths of children, 1306 = 3.8 per cent. Merthyr—population, 52,863—deaths of children, 5381 = 10.5 per cent. Had they been in the same proportion as Haverfordwest, they would have been only 1858—little more than *one-third* of the actual mortality.

There were rather fewer children *living* relatively to the population, in this instance, than in Merthyr: the addition of 288 will place them upon a par, and increase the deaths by 77; making the number 1383 instead of 1306; but this is an un-called-for concession.

Contrasted with the district of Llanelly, Llandilofawr, &c., the deaths of children were 2304, instead of 5381—386 *less than half*. And this result, again, is not referable to the disproportion of children *living* in the two districts; nor to the difference, numerically, of their populations; they being respectively, 52,036, and 52,863—and the children *living*, 7264 and 7312; so that the chance of a child surviving beyond the age of five years, in Llanelly, &c., is *twice* as great as in Merthyr; and in Haverfordwest, nearly *three to one* in its favour. Or, we may vary the illustration and the locality. The population of Monmouth and Chepstow was 41,272—the number of children living, 5242

—the deaths, 1771. Had they died, relatively to the *population*, in the same proportion as in Merthyr, 4201 children would have perished. But the 7th column shows that the proportion of children in Monmouth to the population, was 1 in 7.8, and in Merthyr, 1 in 7.2; and, therefore, that there were more children in the latter to die. Let us equalize them in this respect. $(41,272 : 5242 :: 52,863) = 6714$; the equivalent proportion for the infantile population of Merthyr. And supposing these 6714 children to have died in Merthyr only in the same ratio as children died in Monmouth— $(5242 : 1771 :: 6714) = 2268$ would have been the mortality, instead of $(7312 : 5381 :: 6714) = 4940$, which was the *actual rate* of mortality—a difference in the seven years, of 2672—705, instead of 324 per annum.

We pass on to a third point of comparison, at the other extremity of the scale—*old age*. The period of life so designated in this table, it is necessary to observe, is from “65 years and upwards”—70 years and upwards being that selected for previous comparisons. And here, also, the contrast is highly disadvantageous to Merthyr; and only too clearly confirms our previous conclusions derived from the results furnished by the *general mortality*, and the *relative mortality of children*.

An average of the other fourteen districts, gives the proportion of aged persons (65 years and upwards)—as 1 in 19.3—whereas, in the district of Merthyr, it was only 1 in 34.9—or, expressed in figures—in the fourteen districts, their united populations amounting to 626,713, there were 32,406 aged persons living—51.7 in 1000—whereas, in the district of Merthyr, with a population of 52,863, there were only 1511 aged persons living—28.4, in 1000.

Had the number in Merthyr been relatively equal to that in the other fourteen districts, instead of 1511, it would have been 2735.

This is sufficiently striking. But it will not be less so, and the disparity, perhaps, be more obvious, if we take some of the districts *separately*, and compare them, as in the previous instance, with that of Merthyr. In Tregaron, &c., the proportion of aged persons to the population was 1 in 17.5, or 57 in 1000. In Merthyr, 1 in 34.9, or $28\frac{1}{2}$ in 1000.

Supposing their *populations* to have been *equal*, and the num-

ber of aged persons in Tregaron only in the *same ratio* as they were in Merthyr, ($1000 : 28\frac{1}{2} :: 40.982$)—there would have been only 1167, instead of 2339, in the former—or, the converse—($1000 : 57 :: 52.863$)—there would have been 3013, in lieu of only 1511, aged persons, in the latter.

And so, in Brecon—had longevity been attained by as few persons as in your own district, instead of 57, (as before) in 1000—or 3189; only 1639 persons would have reached their three score years and upwards.

And, in Haverfordwest, instead of 2306, (62 in 1000) only 1058.

It would have been more satisfactory to have drawn our illustrations from the later census of 1851; but this, as the details are not yet published, was not practicable—nor would they have been available for the same purposes, or to the same extent, as those we have employed; seeing that the year 1841 occupies a *central* position in the 7 years—1838—44—and, therefore, correctly represents the *mean* population for the whole period; an advantage which will not be presented for similar statistical investigations till the close of the present year. But, though thus prevented comparing the Merthyr *district* with the other districts of South Wales, in 1851, we have the materials before us (see Table XXIV., p. 39) for ascertaining the proportion of aged persons living in the *town* of Merthyr, in 1851, and in the *district* of Merthyr, in 1841,—relatively to the population. And, unfortunately, the numbers exhibit no improvement in this respect, at the later period. In Upper Merthyr, in 1851, in a population of 23,231, there were 548 persons living at 65 years and upwards—being in the ratio of 1 in 42.3. In Lower Merthyr, in a population of 23,147, 678, or, 1 in 34.1—together, 1 in 37.8—23 and 29, respectively, in 1000—mean, 26 in 1000.

In 1841, as we have just seen, the proportion in the *district*, was 1 in 34.9— $28\frac{1}{2}$, in 1000—a falling off, it will be observed of 2.5 in 1000—or a proportional diminution of 115, in the *town* population of 46,378.

It will, perhaps, be urged, that, though comparatively few lived to 65 years and upwards, *middle age*, or, even, a period of life beyond it, might be attained by a fair proportion of the population. But even this not unreasonable expectation, is not

borne out by the census returns. The localities previously selected (and the other districts would show similar results) present us with the following proportional numbers living at the age of 55. Tregaron, &c., 63; Brecon, &c., 62; Haverfordwest, 60; and Merthyr, 42, in 1000 of the population—being, respectively, in the proportion of 1 in 15.9—1 in 16.1—1 in 16.5, and 1 in 23. We have, surely, fully established the point in question—viz: that *few* persons attain old age in Merthyr. And making every possible and conceivable allowance for differences and peculiarities, either in place or people, referable to climate, occupations, habits, or otherwise—will their combined influences (conceding their existence) by any means explain or reconcile the marked disparities shown to exist?

We are speaking of the extraordinary differences presented by the columns of our table, between the number of aged persons living in the district of Merthyr, as compared with the number living in all the other districts of South Wales, in the year 1841.

The disparity, in question, is clearly not attributable to *emigration*; persons beyond 65 years of age seldom leaving the place of their nativity, or of their subsequent location, at so advanced a period of life.

How, then, is it to be accounted for? The conclusion would seem to be inevitable, that *the sanitary condition of the locality is not favourable to the attainment of longevity*; or, to put it in the most favourable point of view, that it is not without its influence in shortening the duration of existence.

We need not dwell upon the remaining columns of our Table—the *deaths* at 65 years and upwards—the careful analysis, we have just made, of the numbers *living* relatively to the population, having given us the essence of the matter. For, if there were only 28 aged persons living in 1000 of the population of Merthyr, it is clear that they could not die, or, at least, were not likely to die, in the same proportion as in Tregaron, in which there were 57 aged persons living in 1000 of *its* population; the chances of death, *numerically*, being as 2 to 1. And, accordingly, we find, that in Tregaron, the deaths of the aged were in the proportion of 1 in 210, and in Merthyr, 1 in 406, of the population. And so relatively of the other districts—they were not living in Merthyr, to die—they *died before*.

The last column, (the ratio of the deaths at 65 years, &c., to the *living* at this age) presents us, it will be seen, with a tolerably uniform result; the general average being 8.3.

We have already had occasion to remark, that the results furnished by a comparison of the numbers *dying* at *any given age* with the *total* deaths, are, by no means, a decisive sanitary test, unless due regard be had to the numbers *living* at such age, and the *total population*. And of this truth, our table supplies us with ample illustration; of which we availed ourselves (see p. p. 29 and 30) in reference to the mortality of *children*. The principle is not less important in its application to the deaths of the *aged*; one illustration, however, may suffice.

In Tregaron, &c., the general deaths, (by which we understand the deaths at *all ages*,) were 674, and the deaths of *old* persons, 194, in the year; being in the proportion of 287 in 1000. In Haverfordwest, the *general* deaths were 642, and the deaths of the aged, 188; or 292 in 1000—the result of this comparison being slightly in favour of the latter. But this superiority becomes more marked, if we take into account the deaths of the aged *relatively to the respective populations* of the two districts—Tregaron, 40,982; Haverfordwest, 37,139—a difference of 3843; and the *deaths of the aged* the same within 4. Hence, with an *equal* population, they would have been 19 more, or 207—the proportion of those living “at 65 years, &c.”—being 1 in 17.5, and 1 in 16.1.

But there is another, less obvious, and, certainly, less generally suspected feature in vital statistics brought into view by the above table—viz., that a *high ratio of mortality*, is followed by a corresponding *high ratio in the births*; and, so far from *decreasing*, tends, on the contrary, to *increase* the population; or, as expressed by Mr. Chadwick; “in such districts, the fact is observable, that, where the mortality is the highest, the number of births are more than sufficient to replace the deaths, however numerous they may be.”—“Where the mortality is greatest, the births are most numerous, and the population is increasing most rapidly.”—(Mr. Farr’s Letter to the Registrar-General, 4th Report, p. 143).—“A population, in which the influences on the

lower ages are murderous," remarks Mons. Mallett, "is compensated by a high degree of fecundity."

The recognized increase of births after a pestilence, may be adduced in confirmation of the same fact. We have already adverted to it in connection with our 4th Table (p. 7), which exhibits such an increase of births, in the years following the epidemic ravages of 1844, and likewise in those succeeding the year of cholera, 1849.

The following arrangement of the districts in South Wales, in which the mortality was the highest, will render the principle still more obvious:—

TABLE XXIII.

DISTRICTS.	Deaths in 1000 of Population.	Births in 1000 of Population.
Merthyr-Tydfil	27	39
Abergavenny and Pontypool	23	37
Newport.....	22	31
Brecon, &c.	22	32
Cardiff, Bridgend, &c.	19	30
Carmarthen	19	30

—and in the *parish* of Merthyr, the deaths from 1848 to 1853, we have seen, were 29, and the births 40, in 1000 of the population.

Hence, the mortality consequent upon the outbreak of a severe epidemic—be it Influenza, Fever, or Cholera—though it temporarily diminishes, by an excess of deaths, the numbers of a community, subsequently, by an augmentation of births, increases its population. And this increase is an *unproductive* increase; an increase of children, for the most part, born to die. Or, should the older, the adult lives, as frequently happens, be mainly sacrificed, the widowhood and orphanage thus occasioned, entail a proportionate and long-existing burden, as you experimentally know, upon the general community. The neglect, then, of sanitary measures, viewed under this, as under every other aspect, is, clearly and indisputably, the *neglect of sound economy*, and at variance not only with the dictates of justice and humanity, but with the principles of social and pecuniary policy.

The latter and subordinate consideration, we almost hesitate

to couple with the higher and better feeling, that should instinctively regulate our conduct towards our poorer and dependent fellow beings. But if there be, as we fear there are, even in a civilized and christian country, men, on whom we might urge in vain the broad grounds of a generous and enlightened philanthropy, and to whom, therefore, it becomes necessary to descend, and to offer meaner incentives to action—the expense, the costliness, attending the abandonment of duty, may, possibly, supply the requisite stimulus. It might be distasteful, and, perhaps, would be ungracious, to rake up the ashes of the past, and to exhibit before you the retributive penalties entailed upon your own town by the fearful and distressing events of bygone days.

Under the strong promptings of duty, we have more than once approached the subject, and only shrunk from the ungrateful task, from a misgiving as to the chances of its successful prosecution, under circumstances unfavourable to a calm and dispassionate hearing. Let it pass, then; and let us compromise the matter by changing the scene to another, and distant locality. Mr. J. B. Hume, the chief government commissioner, from the evidence laid before him, has stated, that the late visitation of cholera had cost the town of Newcastle-on-Tyne £3800 *for medicine and burials alone*, and entailed an expense of £50 *a-week, for eight years to come*, to support the destitute widows and orphans—or a sum amounting to nearly £30,000—exclusive of several thousand pounds, collected and distributed by the vicar; the loss to the benefit societies in the town, involving a further sum of £10,000. Human life, and distress, and suffering, out of the question, such is the enormous pecuniary penalty incurred by the town of Newcastle-on-Tyne, in the space of a few weeks, by the culpable neglect of sanitary measures!

It remains to be seen whether the ominous and terrible warning will be disregarded.

The last feature we shall notice, in connection with the subject of increased mortality, and the physical causes occasioning it, is the marked influence they conjunctively exert in lowering the *average age of existence*. And if, as has been shown, the general mortality of Merthyr is in excess—the deaths of children

numerous—and the attainment of old age, confined to the few—we shall be prepared to find that the *mean duration of life* is proportionally short.

“The chief test of the pressure of the causes of mortality,” observes Mr. Chadwick, “is, then, the duration of life in years; and whatever age may be taken as the standard of the natural age, or the average age of the individual, in any community, may be taken to correct the returns of the proportions of death in the same community.”—“The actual mortality of most districts is found to be coincident chiefly with its physical condition, and is most accurately measured by the years of vitality which have been enjoyed, i. e. by the *average age of death*. The numbers of deaths increase or diminish considerably, and, frequently, create erroneous impressions; whilst the average ages of death are found to maintain a comparatively steady course, always nearest to the actual condition of the population, and give the most sure indications.” (Supplementary Sanitary Report—Appendix—p. 243.)

As this portion of our enquiry may not, possibly, be familiar to all the members of the Board whom I have the honour to address, a brief explanation of the above terms, will not, I trust, be deemed impertinent.

By the *average age at death*, as applied to a community, is meant, the number of years lived—the length of life attained—by its inhabitants. And this is ascertained by dividing the *total ages of the dead*, in any given year, or series of years, by the total number of persons dying, during such period or periods.

And by the *average age of the living* is understood, the number of years enjoyed by persons still in existence; and this, it will be obvious, is calculated by dividing the total ages of the living, by the population—such calculation being only practicable with the assistance of the census returns, and at the decennial periods when the enumeration takes place.

And it is important, as we have already hinted, to bear in mind, that an equal number of deaths may occur in two districts, and, so far, their sanitary position be, apparently, assimilated; and yet, the *mean duration*—the *chances of life*—be widely different; the proportion of deaths of young children, and other disturbing causes, being sufficient to produce this disparity. But

if, as in your own locality, the other evidences of unhealthiness, as furnished by the general mortality—the mortality of children—the limited mortality of the aged—the small number of old persons *living*—and the prevalence of particular diseases; if one and all of these indications of unhealthiness are co-existent—the remaining proof, derived from the average duration of life, following, as it does, as a necessary sequence, is rather a corroborative, than an essential feature in the evidence.

The population of the *parish* of Merthyr, by the census of 1851, amounted to 46,378—24,728 males, and 21,650 females; that of Upper Merthyr being, 23,231—12,558 males, and 10,673 females; Lower Merthyr, 23,147—12,170 males, and 10,977 females. From the returns of the *ages*, with which I was courteously favoured by the Registrar-General, the table which follows has been constructed. These returns, however, it may be right to explain, only supplied the ages of children living *under five years*, in the *aggregate*; nor was I successful, upon a second application, pointing out the omission, in obtaining the numbers living at the *intermediate ages*; they not having, it appeared, in the case of Merthyr, been separately prepared.

In their absence, the only mode of obtaining the nearest approximation to the actual figures, was by taking the proportion of children living at 6 months, 1 year, 2 years, &c., in the *district* of Merthyr, in the year of the previous census, 1841, and making a rule of three calculation. Thus—the number under 4 years of age, living in the *district*, in that year, being 7312; 1597 of whom were under 1 year—and the number under 4 years of age, living in Lower Merthyr in 1851, being 3251—consequently, $(7312 : 1597 :: 3251 = 710)$ gives us 710 as the proportional number, under 1 year, living in Lower Merthyr; and so of the intermediate ages up to 4 years, in both the divisions of the *parish*.

As the total number of children living in the *district*, in 1841, and in the *parish*, in 1851, were 7312 and 6572 respectively, the results obtained, there can be little doubt, approach sufficiently near the truth for our immediate purpose.

A second explanatory remark is called for. In these official returns, the parish of Vaynor, containing a population of 2667, is *included* in Upper Merthyr, making a total of 25,898.

The simple abstraction of the one from the other, of course, gives the separate population of the latter—23,231. But, unfortunately, the “*ages*” of the population of Vaynor, as stated in a note, at the foot of the official document, had “not been *separately* classified;” which rendered another, and more tedious set of calculations necessary, to obtain the data for the subsequent corrections.

Thus—if in the *united* populations, 25,898—there were 3702 children, under 5 years of age, the proportion of this number, in the *separate* population of Vaynor, 2667—must have been 381. This number, therefore, deducted from 3702, furnishes the correct proportion, 3321, for Upper Merthyr, as shown in the table. Similar corrections were, in the same way, made for *all the ages*, from 6 months to 100 years; involving a host of calculations, and an amount of extra and unsatisfactory figuring, which was, verily, vexatious.

TABLE XXIV.

Ages.	Upper Merthyr.	Years.	Lower Merthyr.	Years.	Parish.
At 6 months	726	363	710	355	1436
1 year	693	693	679	679	1372
2 years	700	1400	686	1372	1386
3 „	623	1869	609	1827	1232
4 „	579	2316	567	2268	1146
	3321	6641	3251	6501	6572
5 „	2641	13,205	2708	13,540	5349
10 „	2288	22,880	2393	23,930	4681
15 „	1999	29,925	2168	32,520	4167
20 „	2699	53,980	2513	50,260	5212
25 „	2416	60,400	2189	54,725	4605
30 „	2019	60,570	1902	57,060	3921
35 „	1616	56,560	1468	50,380	3084
40 „	1249	49,960	1181	47,240	2430
45 „	890	40,050	963	43,335	1853
50 „	654	32,700	748	37,400	1402
55 „	489	26,895	567	31,185	1056
60 „	402	24,120	428	25,680	830
65 „	249	16,385	284	18,460	533
70 „	151	10,570	194	13,580	345
75 „	77	5775	105	7875	182
80 „	56	4480	57	4560	113
85 „	10	850	23	1955	33
90 „	2	180	3	270	5
95 „	2	190	2	190	4
100 „	1	100	0	0	1
TOTALS	23,231	516,416	23,147	520,646	46,378

The total ages of the 23,231 persons, forming the population of Upper Merthyr, are thus shown to be, 516,416 years; giving

22.22 years, or 22 years and 11 weeks, as the age of the individual; 520,646 years, represent the total ages of 23,147 persons in Lower Merthyr; giving 22.49 years, or $22\frac{1}{2}$ years, as the individual age—and 22.36 or $22\frac{1}{3}$ years, as that for the whole *parish*.

Before comparing these figures with the average ages of the *living*, in other towns, it may be convenient to give the average age of the *dead* for Merthyr. The aggregate of the ages of the 768 persons who died in the Upper Division of the parish, amounted to 12,267 years—giving 15.9 years; and in the Lower, of the 695, to 13,027 years, or 19.3 years for the individual—together, 1443 deaths, and 25,295 years lived, or $17\frac{1}{2}$ years as the mean.

The advantage, it will be observed, is still maintained, in both instances, by Lower Merthyr; to only a trifling extent as regards the *living*, but in a more marked degree, in reference to the *dead*—the difference, in the latter case, being 3.4, or $3\frac{1}{3}$ years.

In towns or districts, where the proportion of children relatively to the population, is large, it will readily be understood, that the average age of the *living*, will generally be found, as in your own community, to exceed the average age of the *dying*; the *deaths* of children, compared with those of adults, being numerous, will keep the resultant figure *low*. And the number of children *living*, relatively to the population, being in a higher ratio, the mean duration of life will be correspondingly *raised*. As regards *occupations*, the deaths of Colliers, Miners, Firemen, Puddlers, &c., are too few to furnish *average* results. They will be seen, however, in the following Table.

TABLE XXV.

	Deaths.	Years lived.	Average Age.
Colliers.	35	1439	41.1 yrs.
Miners.	53	2323	44.6 „
Firemen, &c.	52	1789	33.7 „
Totals.	141	5551	39.3 „

Nor must it be forgotten that the deaths are those of *adults*;

and do not, as in the previous calculations, include those of *children*.

In the preceding page, it was proposed to furnish, in a tabular form, the means of comparing the average age of the *living* with other towns. And though we were aware, while penning those lines, that the data required for the purpose, in connection with the late census, had not *then* been made public, we were given upon authority to understand that this would very shortly be done. Up to the date, however, of these pages passing through the press, (October) the Superintendent Registrars here (Bristol) had not received them; and we are unable, therefore, to carry out our intentions. For the same reason, we are equally prevented making a similar comparison between Merthyr and other localities in relation to the average age of the *dead*, since the census year; and can only fall back upon the results obtained at an earlier period.

TABLE XXVI.

Average Age at Death.

Towns.	Gentry, &c.	Tradesmen.	Mechanics.	General Average
Kendal (Union).....	45 yrs.	39 yrs.	34 yrs.	36 yrs.
Clifton	43	39	25	33
Bath	55	37	25	31
Four Metropolitan Unions.	44	29	22	26
Leeds (Borough)	44	27	19	21
Manchester	38	20	17	20 (? 18)
Bolton (Union)	34	23	13	19
Liverpool.....	35	22	15	17
Merthyr-Tydfil	"	"	"	17½

The last column—the general average—is that which immediately concerns us; the others, showing the average age of the different *classes*, are introduced as not being devoid of interest.

We must plead guilty of an oversight in not arranging a similar classification of the deaths in Merthyr.

In the general average, Merthyr occupies an intermediate position between Manchester and Liverpool; being exceeded by the latter town alone *in the loss of the years of life*—Liverpool, 17—Merthyr, 17½! Upon turning to p. 16, the cause of this close assimilation will be sufficiently apparent—the deaths of 528

children in 1000 total deaths, in the one case; and of 527 in the other!

Infantile mortality in both, excessive, and indicative of the operation of physical evils in a "maximum degree of intensity!" Some approach to a slight palliation of the enormous sacrifice of life in Liverpool might be found in the density of its builded area—138,224 inhabitants to a square mile—in its 10,692* houses situated in *courts*, and inhabited by 55,534 persons—in its 6294 *cellars*, containing 20,168 occupants.† But what parallel is there between Merthyr-Tydfil, with its relatively small population, distributed in cottage dwellings through a semi-rural valley nearly three miles in extent—and such a densely peopled, court-occupied town, as Liverpool? What possible pretext—what shadow of excuse—can be assigned for its figuring in the same category with the great northern leviathan, and almost rivalling it in mortality, and in the yearly holocaust of infant lives!

If there be not something rotten in the state of its little Welsh associate, where shall physical rottenness be found?

It may not be uninteresting to distinguish the mortality occurring in the different *months* and *seasons* of the year.

TABLE XXVII.

UPPER MERTHYR.					LOWER MERTHYR.				PARISH.
	Under 5 yrs.	At 60 yrs. and upwards	At other Ages.	Total.	Under 5 yrs.	At 60 yrs. and upwards	At other Ages.	Total.	Total Parish.
January ...	53	4	17	74	44	5	16	65	139
February ..	47	6	23	76	31	4	12	47	123
March	48	5	12	65	45	5	10	60	125
April	47	6	20	73	27	5	23	55	128
May	24	5	15	44	38	5	15	48	102
June	25	3	9	37	26	3	26	55	92
July	18	2	13	33	14	6	21	41	74
August	39	1	9	49	32	3	17	52	101
September..	31	4	10	45	19	8	14	41	86
October	38	4	21	58	20	5	15	40	98
November..	37	5	15	57	26	4	14	44	101
December..	56	6	21	83	33	5	12	50	133
TOTALS.	458	51	185	694	355	58	195	608	1302

* Let the reader bear in mind that this number considerably exceeds that of the *whole inhabited Houses in Merthyr*, which amounted to only 8354 at the last census, tenanted by only 46,378 persons—and that *cellar* habitations are unknown in Merthyr!

† See Dr. Duncan's report "on the Physical Causes of the high rate of mortality in Liverpool"—1843 p. p. 10 & 11.

The deaths of colliers, miners, &c., having been *separately* abstracted from the returns, without noting the *dates*, could not be introduced in the above tables: the difference in the number of the *total* deaths is likewise thus accounted for.

TABLE XXVIII.

	Spring.	Summer	Autumn	Winter.	Totals.
Deaths of Children ...	245	145	174	249	813
„ Old Persons	31	24	25	29	109
„ at other ages	100	99	86	95	380
TOTALS.	376	268	285	373	1302

In this table, the *ordinary* arrangement of the seasons is observed; considering February, March, and April, as the Spring months; May, June, and July, the Summer; August, September, and October, the Autumn; and November, December, and January, the Winter months.

The following is the arrangement observed in the mortality returns of the Registrar-General; the Spring quarter including April, May, and June; the Summer, terminating in September; the Autumn, in December; and the Winter quarter, in March.

TABLE XXIX.

	Spring.	Summer	Autumn	Winter.	Totals.
Deaths of Children ...	187	153	205	268	813
„ Old Persons	27	24	29	29	109
„ at other Ages..	108	84	98	90	380
TOTALS.	322	261	332	387	1302

The effect of the colder temperature of Winter, and the variable character of the Spring months, in increasing the mortality, is strikingly evidenced in the larger number of deaths, in all the three classes, especially in those of children and aged persons, at these seasons—494 of the former, and 60 of the latter, as contrasted with 319 and 49, in the Summer and Autumn quarters, according to our first table—and 455 and 56, as compared with 358 and 53, in our second table.

This relative mortality of the seasons, the following table will render more apparent.

TABLE XXX.

	Ordinary arrangement of Seasons.		Arrangement of Registrar- General.	
	Deaths in Winter and Spring per cent. of Total Deaths.	Deaths in Summer and Autumn per cent. of Total Deaths.	Deaths in Winter and Spring per cent. of Total Deaths.	Deaths in Summer and Autumn per cent. of Total Deaths.
Deaths of Children ...	57.52	42.47	54.45	45.54
" Old Persons	60.76	39.23	55.96	44.03
" at other Ages..	51.31	48.68	52.10	47.89
" at all Ages	55.04	44.95	51.37	48.62

The difference, likewise, in the Upper and Lower divisions of the parish, will hardly escape observation—62.88 per cent. of the total deaths of *children*, occurring in the Spring and Winter, in the Upper, and 58.02 per cent. in the Lower division; the higher and more exposed position of Dowlais explaining, in some measure, this disparity.

The following Table is prepared from data given in the volume, (p. 108), recently published "by authority of the Registrar-General," entitled, "The census of Great Britain in 1851; comprising an account of the numbers and distribution of the people, their ages, &c." Its interest and value, as illustrating statements contained in the preceding pages which were already printed, will, it is hoped, excuse its introduction a little out of the proper place;—nor is it without some affinity to the point we were just now considering.

TABLE XXXI.

Ages of Population in England and Wales, and Merthyr, in 1851.

ENGLAND & WALES.

MERTHYR.

Ages.	Population.	Per cent of Population.	Popula- tion.	Per cent of Population.	Difference.
Under 5 years.	2,348,107	13.09	6572	14.17	+ 1.08
5 "	2,092,359	11.11	5349	11.53	+ 0.42
10—15 "	3,670,546	20.47	8848	19.07	—1.40
20—30 "	4,413,208	24.61	13,738	29.62	+ 5.1
35—45 "	2,856,167	15.82	7367	15.88	+ 0.6
50—60 "	1,716,398	9.57	3288	7.08	—2.49
65 & upwards.	830,824	4.63	1216	2.62	—2.1
70 & "	*503,305	2.80	*683	1.47	—1.33
	18,430,914	102.10	47,061	101.44	
	*503,305	2.80	*683	1.47	
TOTALS.	17,927,609	99.30	46,378	99.97	

This Table is read thus—in England and Wales, with a population of 17,927,609, in the year 1851, there were 2,348,107 children under 5 years of age—13.09 per cent. or 130 in 1000; and in Merthyr, with a population of 46,378, there were 6572 children under that age—14.17 per cent. or 141 in 1000; the difference being 1.08 per cent. or rather more than 10 in 1000.

The **excess* of children under 5 years of age, in Merthyr, relatively to its population, is thus shown to have been (in round numbers) 500. At 5 years, the proportion is more nearly equal— $11\frac{1}{10}$, and $11\frac{1}{2}$ per cent. or 111, and 115, in 1000; 185 only in excess. From 10 to 15, the case is reversed—649 *fewer* persons living at these ages in Merthyr, than in England and Wales. From 20 to 30, on the contrary, *more*, to the extent of 2319; or, at the rate of $5\frac{1}{10}$ per cent.—51 in 1000.—From 35 to 45, the proportion is almost precisely the same— $15\frac{3}{4}$, and $15\frac{3}{8}$ per cent. or, 158 in 1000 of both populations. From 50 to 60, there is a marked falling off in Merthyr; 1159 *less*—equal to $2\frac{1}{2}$ per cent. or 25 in 1000; and this continues in an accelerated ratio as we ascend in the scale of age;—showing a difference, at 65 years and upwards, of 928 *against* Merthyr—that is to say, had an equal number of persons of this advanced age, relatively to its population, been living in Merthyr, as were living in England and Wales, instead of only 1216, there would have been 2149:—and, at 70 years and upwards, instead of 683—1302. These latter features of our table are strikingly corroborative of the same fact—the paucity, viz: of aged persons—as previously illustrated at p. p. 25 and 26 of this report. The intelligent reader will readily make his own application of the other data.

The course of our enquiry naturally leads us to an investigation into the direct Causes—the Diseases, that is—which entail such a fearfully premature, and unnatural mortality. In the annexed tables, the diseases which proved fatal in the year 1852, are arranged in five groups, and include nearly four-fifths of the whole number; sufficiently comprehensive, therefore, for our immediate purpose.

* In the last column of the Table, headed, “Difference,” the signs + and — indicate whether the numbers are in *excess* or *otherwise* in Merthyr; and to what extent.

TABLE XXXII.

Causes of Death in the Year 1852.

UPPER MERTHYR.

1852. Causes of Death.	Under 5 Years.	Above 5 Years.	Total Deaths.	Per cent of Total Deaths.	Proportion.	*Proportion to Population.
Consumption	23	87	110	14.23	1 in 7.0	1 in 217
Other Diseases of Lungs ..	49	38	87	11.25	8.8	275
Serofula	46	5	51	6.59	15.1	469
Epidemic, Endemic, and Contagious Diseases .. }	165	74	239	30.91	3.2	100
Convulsions	142	0	142	18.37	5.4	168
Accidents, &c.	0	18	18	2.32	43.0	1329
Other Diseases	28	98	126	16.30	6.1	110
Unknown	0	0	0	0	0	0
TOTALS.	453	320	773	99.97		
LOWER MERTHYR.						
Consumption	16	87	103	15.19	1 in 6.5	1 in 231
Other Diseases of Lungs ..	32	25	57	8.40	11.5	418
Serofula	45	7	52	7.66	13.0	458
†Epidemic, Endemic, and Contagious Diseases .. }	101 } 129 }	56 } 66 }	157 } 195 }	23.11 } 28.76 }	4.3 } 9.4 }	122
†Convulsions	69 } 108 }	0	69 } 108 }	10.17 } 15.92 }	9.8 } 6.2 }	220
Accidents, &c.	1	35	36	5.29	18.8	662
Other Diseases	26	93	119	17.55	5.6	200
†Unknown	67 } 0 }	18 } 8 }	85 } 8 }	12.53 } 1.18 }	7.8 } 84.7 }	2980
TOTALS.	357	321	678	99.95		
PARISH.						
Consumption	39	174	213	14.67	1 in 6.8	1 in 224
Other Diseases of Lungs ..	81	63	144	9.92	10.0	331
Serofula	91	12	103	7.09	14.0	463
†Epidemic, Endemic, and Contagious Diseases .. }	266 } 294 }	130 } 140 }	396 } 434 }	27.29 } 29.91 }	3.6 } 3.3 }	110
†Convulsions	211 } 250 }	0	211 } 250 }	14.54 } 17.22 }	6.8 } 5.8 }	191
Accidents, &c.	1	53	54	3.72	26.8	884
Other Diseases	54	191	245	16.88	5.9	195
†Unknown	67 } 0 }	18 } 8 }	85 } 8 }	5.85 } 0.55 }	17.0 } 181.2 }	5972
TOTALS.	810	641	1451	99.96		

* The "Proportion," in these Tables, has reference to the Population of Merthyr in 1852, which we estimated at 47,778 (see Table 13, p. 18)—the population of Upper Merthyr would, therefore, be (23,231 + 701) 23,932; and that of Lower Merthyr, (23,147 + 698) 23,845.

† To save the repetition of the 2nd and 3rd Tables, the *corrected* numbers for Epidemic, &c. diseases, Convulsions, & Unknown causes, are placed *under* those extracted from the registers; in the addition of the columns, the two sets of figures are, of course, to be taken *separately*.

The above year (1852) was selected as that immediately following the census. Any analysis of the causes of death, as affecting the *Lower Division* of the parish, must necessarily be imperfect, and open to doubt and objection, from the large proportion, amounting to an eighth of the whole number—85 out of 678—being recorded as “*unknown*.” Many cases, terminating fatally, doubtless, occur, unseen, and consequently, *uncertified*, by a medical man; and it then becomes the duty of the local registrar, carefully to enquire into the history and circumstances of each case, with a view to the detection of the cause of death, and the prevention of life being wantonly or carelessly sacrificed—and the instances must be very few, indeed, in which, under due investigation, the general symptoms and other particulars may not be ascertained with sufficient accuracy to enable the registrar to enter the case appropriately.

In the *Upper Division*, it will be observed, there is *no hiatus* of the kind; *every death* of the whole number, 773, (though 100 more than in the Lower,) being accounted for—a plain proof that equal precision, had equal attention and vigilance been exercised, might have been attained in the other.

With this qualification, (and, with the record before me, it was impossible to avoid comment) we may proceed to use the materials so far as they are available.—A reference to Table XXXII, shows that 67, of the 85 deaths from “*unknown*” causes, were those of children under 5 years of age—60, under 1 year—4, under 3, and 3, under 5 years. Of the former number, (67) we may, probably, safely assume that the large majority were occasioned by *Convulsions and Epidemic, &c., diseases*.

And we are the more borne out in this conclusion, from the disparity presented, under these heads, in the two divisions—Convulsions, 69 and 142—and Epidemics, &c., 157 and 239.

But the *facts* alone would enable us correctly to assign the actual proportion. If, however, such disposition of the deaths from “*unknown*” causes be legitimate, the way is cleared for dealing with the mortality from other causes.

Of the total deaths in the *parish*, 213 in 1451—1 in 6.8—was from Consumption—which is somewhat less than occurred in the years, 1840—3, as given in the report of Sir H. T. De-la Beche. Of “other diseases of the lungs,” the proportion shown in our

table, is 144—1 in 10—the two divisions being 87—1 in 8.8 Upper—and 57—1 in 11.5, Lower—the higher number of deaths of both children and adults in the former, from pulmonary affections, being probably, referable to its lower temperature, from its more elevated and exposed position. For reasons already explained, the defective state, viz: of the returns for Merthyr Proper, no just comparison can be instituted between the mortality of the two divisions from “epidemic, endemie, and eontagious diseases.” In the Upper division, however, the data being strictly reliable, 239 deaths, or nearly *one third* of the total deaths—1 in 3.2—30.9 per cent—from these eauses, must be considered a very high ratio: the average per ecentage of the deaths from epidemic, &c., diseases, in the 7 years, 1841—47, being only 21.3 per eent. or not *one-fifth* of the total deaths. Of these 239 deaths, 165 were those of young ehildren. In the Lower Division, only 157 deaths, including adults—1 in 4.3, or 23.1 per cent. are *recorded*.

But, the great probability is, that considerably more than this number died from such diseases. If, therefore, for the reasons assigned in the preceding page, we add 28 to the 101 deaths of young ehildren, and 10 to the 56, above five years of age—making them, respectively, 129 and 66—these figures will, we believe, more nearly represent the eorrect proportion.

On this assumption, the deaths in Lower Merthyr will be 195, and in the parish (239 + 195) 434 from epidemic &c., diseases, or nearly *one-third* of the total deaths; and the fourth line in our last table will read thus:—

	Under 5 Years.	Above 5 Years.	Total.	Per cent. of Total Deaths.	Propor. tion.
Deaths from Epidemic, &c., Diseases	294	140	434	29.91	1 in 3.3

We have thus disposed of (28 + 10) 38 of the deaths from “unknown” eauses; leaving (85—38) 47, still to be dealt with—that is, 39 deaths of young ehildren, and 8, of persons above 5 years of age. To the marked disparity between the deaths, in the Upper and Lower divisions of the parish, from Convulsions, (142 and 69) we have already adverted; and making a

similar correction, by the addition of 39 to the latter, the number will be 108;—or nearly *one-sixth* of the total deaths—and the fifth line in our table will stand as follows:—

	Under 5 Years.	Above 5 Years.	Total.	Per cent. of Total Deaths.	Proportion.
Deaths from Convulsions. }	250	0	250	17.22	1 in 5.8

As we lay no claim to intuition, we shall make no attempt to rescue the 8 deaths still unappropriated, from the mysterious “unknown.”—As it is, our patience and ingenuity have been severely taxed, in acting medical sponsor for the Lower Division of the parish, in 78 *uncertified* cases.

Small Pox proved fatal to 103 persons, of whom 83 were children. Fever, to 82—28 being children—69 deaths occurred from Diarrhæa—57, those of children. But the last number is, probably, understated; many of the deaths entered, “*unknown*,” being referable, in all likelihood, to this cause—and this assumption would tend to reconcile the marked discrepancy, (40 and 17) of the two divisions, as they appear in the registers.

The following Tables show the proportionate number of deaths from Consumption, and from Convulsions, in Merthyr, and in five of the largest towns in England; but, it is only fair to observe, that while the latter embrace an *average* of *three* years, the numbers for Merthyr are limited to the *year* 1852; and that, as regards the Lower Division, in the Table of Convulsions, they are *corrected* numbers.

TABLE XXXIII.

Towns.	Deaths from Consump- tion.	Per cent. of Total Deaths	Proportion.	Proportion to Population.
Liverpool	4120	18.31	1 in 5.4	1 in 153
Birmingham	1910	17.74	5.6	207
Leeds	2316	17.59	5.6	209
Manchester	2145	16.17	6.1	175
Merthyr-Tydfil ..	213	14.67	6.8	224
Metropolis	22027	13.39	7.4	246

Of the six towns in the Table, Merthyr, with the exception of the

Metropolis, exhibits the least mortality from Consumption—the respective per centages being $13\frac{1}{2}$, and $14\frac{7}{10}$, or, dropping the decimal points, 133 and 146 in 1000. Consumption, therefore, notwithstanding the large rain-fall—“the cold and changeable character of the climate”—and “the nature of the avocations” of the working class—can hardly, it would seem, be considered a very prevalent or fatal disease in Merthyr; and it certainly is not the disease of *childhood*.

How necessary it is in sanitary investigations, if we would arrive at just conclusions, to take into account the *occupations* of the people, is strikingly exemplified in the case of Birmingham; which, though comparatively a healthy town, stands second in the list, as presenting, next to Liverpool, the highest mortality from Consumption.

This arises, in a great measure, from the various metallic and other processes in which so large a portion of the working classes are engaged; occasioning the inhalation of dust and the finer particles of metal, which, by producing irritation in the air passages, frequently predisposes to this disease. Among the *female* portion of the community, few of whom are employed in such works, Consumption is, by no means, so fatal.

TABLE XXXIV.

Towns.	Deaths from Convulsions.	Per cent. of Total Deaths	Proportion.	Proportion to Population.
Merthyr-Tydfil ..	250	17.22	1 in 5.8	1 in 191
Liverpool.....	3328	14.51	7.0	190
Manchester	1765	13.30	7.5	213
Leeds	1612	12.24	8.1	301
Metropolis	11,993	7.29	13.7	453
Birmingham	616	5.72	17.4	645

Merthyr-Tydfil, in this Table, at the head of the list!—the mortality from Convulsions being much greater in Merthyr, than in the other five towns, not excepting even Liverpool— $17\frac{1}{2}$, as compared with $14\frac{1}{2}$ per cent.—172, and 145, in 1000 of the total deaths; the absolute mortality, that is, the proportion to the population, being respectively 1 in 191, and 1 in 190: and the registers show that the deaths from Convulsions are almost exclusively confined to children, or rather, infants, within the first

twelve months after birth. But what has Merthyr, we again ask, *in common with* Liverpool, that it should be thus closely linked with the most unhealthy town in the kingdom? Little or nothing, as the association of their very names declares, save that both, as towns, imply the assemblage of human beings in a community for purposes of social and industrial polity. And little or nothing, as we have already seen, in the more marked local circumstances—the great physical features—which distinguish one town from another, and, to so considerable an extent, characterize the vast commercial seaport. And the comparison, be it observed, is made at the very *worst* period of Liverpool's sanitary history; before the abolition of its pestiferous *cellars* as human habitations, and the effectuation of other great sanitary ameliorations, which the very acme of the evil rendered imperative!—between Liverpool as it *was*, and Merthyr as it *is*!

Tried, then, by all the tests derivable from vital statistics, and evidentiary of the sanitary condition of a town, we are forcibly driven to the conclusion, that Merthyr occupies a highly unfavourable, and, even, alarming position—in plainer terms, that its condition is that of *extreme unhealthiness*.

Its general mortality, we have seen, is exceeded by few, even of the largest and most populous towns in the kingdom; and by none, we believe, of the same area, and relative number of inhabitants—and that the rate of mortality is *on the increase*.

And our calculations equally show, that the *stress* of mortality—the larger proportion of deaths—are those of *young children*—that the deaths of *aged persons* are extremely few; longevity being widely the exception—and, consequently, that the average age at death, and the average age of the living, are proportionally low.

Figures, thus carried out through all the forms of calculation of which they are susceptible, and yielding in each, and every instance, uniformly and invariably, the like result, must be decisive in their indications. We have, assuredly, no wish, and, unfortunately, no occasion, to distort or exaggerate facts. We have endeavoured to deal with them candidly and truthfully; and, in this spirit, the present and former reports, we trust, have been penned.

Extenuating or qualifying features have not been intentionally overlooked or suppressed; and having just enumerated those telling most unfavourably upon your local community, it is right that circumstances presumed to be of a modifying or relieving character, should be stated with equal distinctness.

Your local population, it is admitted, is, to a very unusual extent, composed of the *labouring classes*; and, inasmuch as this class, in all towns, are more exposed to the operation of physical causes affecting health and life, than the middle and upper grades of society—just in proportion as in your own town, they exceed the ordinary average, are you fairly entitled to a corresponding allowance for this local peculiarity. The actual numerical proportion, we have no means of correctly ascertaining. But, be it what it may, to such preponderance is attributable the *larger number of Births*, and the relative excess of infant mortality, as compared with populations in which the classes are more equally distributed. At the same time, it will not, as you will necessarily perceive, account for the *surplusage* of deaths among children relatively either to the *births*, or to the *number of children living*.

A larger proportion of the children of the poor, it is admitted, die, than the children of the middle and wealthier classes; but, where the legitimate ratio, referable to physical privations and discomforts, is exceeded, other causes, not necessarily connected with relative social position, will alone explain the disparity.

This distinction—for it is an important one—we have, we trust, succeeded in explaining clearly.

The contraction of *early marriages*, facilitated by the high wages earned by young men yet in their teens, is another circumstance leading to the same result—the *augmentation of births*.

The *occupations* of your industrial population, the majority being employed in the collieries, mines, and iron works, must prove, it is urged, detrimental to health, and tend to abridge the duration of life. That life is not materially affected, or, rather, that the deaths are not materially increased, by the mere *casualties* incidental to such employments, (*more numerous* though

they be than *should occur*) we have shown by their actual enumeration. (See Table 14, p. 20.)*

But, that the *general health* of men so engaged, is, more or less, affected, we are not prepared or disposed to deny. *To what extent*, your resident medical men connected with the works, are much better qualified than a stranger, to form a correct judgment. And two of these gentlemen, Mr. White and Mr. Probert, having expressed their opinions, I take the liberty of quoting them from Mr. Rammell's report. Mr. White, the medical officer of the Dowlais establishment, thus gives his testimony.

"The most frequent diseases amongst the workmen are—"muscular rheumatism, indigestion, 'fever-cold,' and affections of the lungs, especially asthma, all due to the nature of their *avocations*, and *the cold and changeable character of the climate*. The women suffer principally from indigestion, and, almost universally, constipation with all its attendant evils."

"At birth, no children," Mr. White further states, "are *larger*, or *more healthy*. It is by obtaining nourishment at the breast of a mother who is not in good health, and by being afterwards exposed to the *impure atmosphere of a small, over crowded, and ill-ventilated house*, (especially *sleeping-room*) surrounded by *collections of filth* of all sorts, and, probably containing within itself ordure, retained for a convenient opportunity to dispose of it—*causes, which have operated previously to disorder the health of the mother*—that the child is *predisposed* to disease, and which, *continuing to exert their baneful influence* when the child is attacked with slight disorder, *go on to aggravate the mischief*, and to produce so frequently a *fatal result*. No women tend their children, both in health and disease, more kindly, and keep them more cleanly, than do the *Welsh*." In reading this candid and intelligent statement of Mr. White, which, coming from so experienced and accurate an observer, is entitled to the utmost respect—is it not apparent that the writer, while freely admitting that certain forms of

* Mr. Herbert Mackworth, Government Inspector of Mines, informs me, that the *fatal* accidents, which occurred in the Coal-mines connected with most of the large Iron Works about Merthyr, in the last three years, 1851—2, & 53, amount, on an average, to *nearly double* the number which happened, proportionally to the men employed, during the same period, in the whole of the Collieries in Great Britain.

disease (none of them, it will be conceded, of a very fatal character, or calculated materially to shorten life) are traceable to the employments of the men—attaches much more importance to the physical evils *within and around their dwellings*, as operating causes, in the production of the greater sickness and mortality characterizing your population? That these local causes should exert more marked effects upon the health and well-being of the *women and children*, is a necessary consequence of their greater exposure to their influence. “At birth, no children are larger, or more healthy”—no children tended, “both in health and disease, more kindly, or kept more cleanly.”

What would you more? Fine, hearty children!—Kind and attentive mothers! What is there to prevent a race of young giants being reared in Dowlais?

Mr. White shall answer the question—“the impure atmosphere of a small, overcrowded, and ill-ventilated home, surrounded by collections of filth.”

And are not these the very identical physical evils upon which we have insisted so strongly, as the predisposing causes of disease, and the only true expletives of the excessive mortality of Merthyr?

“*In no degree*,” is the emphatic declaration of Mr. White, “is the mortality due to causes over which *the poor themselves have any controul*.”

It is, then, due to causes over which they have no controul. And what are, or can these be, but those which he so graphically describes—a polluted atmosphere, and filthy abominations?

Mr. Probert, surgeon to the Plymouth Works, writes as follows:—“The colliers and miners are the men most affected by the nature of their employment; they suffer from affections of the chest, and frequent ill health—I think this arises from the *nature of their work*, from the vitiated atmosphere in the mine, and want of light. The men remain in the mine, generally, about twelve hours daily. During the winter, many of the men do not see daylight from Sunday to Sunday. In considering the mortality of the town, *some allowance* should be made for the *unhealthy employment* of the miners and colliers, but, I think, not for the other class of workmen. The *great source* of mortality is amongst the *children*. I attribute

“this great mortality, first, to the mode in which they are
 “*brought up*; frequently, to the unhealthy state of the parents,
 “and by want of earlier application for medical relief; and
 “also from epidemics, such as scarlet fever, measles, whooping-
 “cough, small-pox.”

“No doubt,” adds Mr. Probert—and pray mark the statement
 —“no doubt, the accumulation of filth in the town, and the bad
 “state of the drainage, favour the spread of epidemics.”

As this equally explicit opinion of Mr. Probert, though slightly varying in minor points, substantially agrees with that given by Mr. White, their united testimony may fairly be considered as embodying the views of your local Faculty. We need only, therefore, call attention to the last paragraphs.

The greater mortality occurring amongst children, is attributed, *inter alia*, “to the mode in which they are *brought up*.” We shall not, probably, err in regarding this expression as nearly synonymous with the words used by Mr. White—“exposed to the impure atmosphere of a small, confined dwelling.”

The diseases enumerated, as proving specially fatal to children, Scarlet-fever, Measles, &c., are precisely those which are always found to prevail in bad sanitary districts, in which such affections assume a malignancy, and spread with a rapidity, never witnessed in healthy localities. Under the general name of “Epidemic, Endemic, and Contagious diseases,” they form, in fact, the very tests, by which sanitary condition is ascertained. And hence, the remark which immediately follows in Mr. Probert’s statement, directly connecting them with accumulations of filth, and defective drainage.

But, assuming that the writer, by the expression, “*brought up*,” had likewise in view, duties more strictly maternal—the nursing, feeding, and general treatment of children in infancy—and considered that to the negligent or injudicious performance of these duties, the fatality in question was *partly* referable, (which is readily conceded)—still, unless it can be shown that such errors in rearing their offspring, be they inadvertent, or the result of ignorance, more generally prevail, or are more baneful in their effects, in Merthyr, *than in other towns*—as operating causes, they will obviously fail to account for the greater mortality of children in your own, than in other communities.

One fertile source of the ailments occurring to infants among your labouring population, it is asserted, arises from the practice, said to be almost universal, of giving them a portion of the food, be this what it may, of which the family are partaking; the greater the facility and apparent relish with which the little ones perform their part at the social meal, and the greater the delight of the admiring parents at what they consider satisfactory evidence of vigour and healthiness.

That irritation, sickness, convulsions, &c., must frequently be occasioned by so absurd and inconsiderate a practice, there can, of course, be no possible doubt.

But the question still reverts, is it *peculiar, or confined to Merthyr*? Are not equally foolish parents to be found elsewhere? And, if so, unless it can be shown that the diet of which they, and, consequently, their children partake, is of a *more objectionable and hurtful character* than ordinary, the statement amounts to nothing.

Our own observations, during several years' attendance, as Dispensary Physician, upon the families of the labouring poor, strongly induce the belief that similar absurd notions almost invariably prevail amongst the class in question; to the enquiry, in the case of a sick child, "what do you give it to eat?" the nearly uniform answer being, "it gets *what is going*."

Now, the earnings of your industrial population enable them to obtain what, in truth, the exhausting nature of their employments requires, a nutritious and wholesome diet, of which animal food forms a liberal proportion. The chances, then, as compared with towns generally, are, that children in Merthyr are made to swallow things less trashy and detrimental, and, consequently, that they *suffer less* in this respect, than the majority not so favourably circumstanced; the juices of beef and mutton (and infants are capable of little beyond suction) or even morsels of meat itself, though stronger aliment than their stomachs can well appropriate, being less injurious than the fat of bacon, or other gross and greasy ingredients, which, with vegetables, form the more ordinary fare of the working man's table. We need not pursue the subject in further detail.

But there is a matter, vitally connected with the rearing of children, which must not be passed over. In many of our large

manufacturing towns, such as Manchester, Leeds, Bolton, &c., the female portion of the inhabitants are largely employed in the cotton and woollen mills; mothers, thus withdrawn from their homes, necessarily entrusting their children either to the care of members of the family, (themselves, in many instances, mere children) or to strangers less interested in their welfare. Not unconscious of the delinquency, nor wholly lost to maternal feelings, as a preliminary to the unnatural transfer, the soothing, but detrimental potion, is freely administered; and temporary *quietness*, it may be, thus ensured during long hours of absence. And should a first dose fail, a second is only too readily supplied by hirelings, who can have little scruple in effectually following up the intentions of the mother.

That numbers of infant lives are thus directly sacrificed, or their health irretrievably injured, are facts too notorious in reference to the districts in question, to require the formality of proof. *Your* local occupations, fortunately, make no such demand upon the services of the *married* females of your labouring population. They remain at home, to attend to their families and domestic duties; and “no women,” Mr. White has expressly told us, “tend their children, both in health and disease, more kindly than do the Welsh.”

More favourably circumstanced in this respect, the sale of *narcotic* compounds, from all the enquiries I have made upon the subject, would appear to be very limited in Merthyr; and this conclusion is amply borne out by the observation of your resident professional men, that they have “no reason to suspect that so pernicious a practice prevails to any serious extent.”

This reference to the Faculty, reminds me of an advantage enjoyed by your industrial population, which it would have been unpardonable to have lost sight of; the facility, viz: of obtaining *immediate* medical advice from the officers professionally connected with the Iron and Mining establishments, who are appointed for the special purpose of attending the workmen, and their services remunerated by the proprietors. By such wise and humane provision, sickness and disease are detected and arrested at the very onset; and not, as under the ordinary circumstances in which the labouring classes are placed, too frequently happens, allowed to gain the ascendancy, from such

assistance having to be sought for at a considerable and inconvenient sacrifice of time and trouble. This, it will be admitted, is an arrangement well calculated to diminish the prevalence of disease, and proportionally to avert fatal results—and, yet, notwithstanding the constant and skilful supervision thus exercised by your able professional men—whose advice has only to be requested and it is given—the deaths of your industrial population greatly exceed the ordinary mortality.

The greater *humidity* of your climate, the rain-fall exceeding the average, may, and probably, does act, in some seasons especially, in conjunction with other influences, as a predisposing cause in the generation and extension of sickness.

But, from the generally sloping character of the builded area, this cause, per se, must, we conceive, be of limited operation.

Moreover, the cheapness and excellent quality of your coal, and the facility, therefore, of the labouring classes, at all times, commanding a warm and glowing fire-side, go far to counteract the otherwise injurious effects of occasional dampness.

On the other hand, (for our desire is to hold the scales equal) notwithstanding the numerous furnaces in blast, from the nature of the coal employed, the atmosphere is more than ordinarily *free from smoke*, and contrasts favourably, in this respect, with other, and especially, manufacturing towns.

Nor is the *density* of your population, in relation to the area occupied by houses, in consequence of the extended distribution of the cottage buildings, at all comparable to that of the majority of town districts. Though frequently overlooked, or not duly considered in statistical enquiries, this is an important distinctive feature. For, it may safely be assumed, that the *mortality of towns*, generally *increases proportionally with their density*. In this respect, Merthyr undoubtedly occupies a most favourable position, more than counter-balancing many of the alleged drawbacks.

We have thus reviewed, briefly and impartially, the various features and circumstances likely to throw light upon the sanitary condition of your local community, and to explain or modify the results obtained from a careful, and somewhat elaborate analysis of the registered returns of mortality. And though

we would gladly have relieved the harsher and darker shades of the picture by softening touches, and a brighter colouring, truth precluded such a handling of our subject.

And if the portraiture we have drawn, however faulty in execution, be faithful to the original, as candid observers, you will hardly blame the artist for its correctness, though you might wish the features less repulsive.

With *you* it rests to impart to them a more pleasing aspect, for the future delineation of an abler and more fortunate limner. To us, for the moment, belongs the less grateful task of retaining, while we seek to account for, their uncomeliness.

What, then, (dropping the figure) are the causes to which the unhealthiness of Merthyr must be attributed? Not, we think we have shown, to situation or climate—not to its soil or atmosphere—not to the habits or occupations of its inhabitants—not to the density of the builded area—not to the absence of employment; and certainly, not to the inadequate remuneration of labour—not, consequently, to an inability to procure the comforts and necessities of life. And, in this brief, but comprehensive enumeration, we have well nigh exhausted the list of causes, likely, in their nature, to affect the health and well-being of a population, without eliciting a satisfactory solution of the question. At the same time, we are far from asserting, as our previous observations indicate, that those particularized do not exercise *some* degree of influence. But, we are not, upon an impartial consideration of their bearing, and a careful adjustment of the favourable and unfavourable nature of their effects, prepared to allow that Merthyr, relatively with other towns, occupies, by any means, a disadvantageous position. On the contrary, we believe the balance to be very decidedly in its favour.

If correct in this conclusion, and the unhealthiness of Merthyr be not, or only to a very limited extent, attributable to any of the supposed causes—the enquiry still reverts, how is the high rate of its mortality to be accounted for? In all honesty, we believe that it is mainly referable to *local and self-created conditions*; and that these are, the *vicious construction of houses*—the *inadequate supply of water*—the *absence of drainage*—*defective ventilation*, and the necessary consequences, the *accumu-*

lation of filth, atmospheric impurity, and the extensive and fatal prevalence of disease.

As regards the last of these conditions—*defective ventilation*—I had so recently the honor of bringing the whole subject, together with practical suggestions for its correction, in a special report, fully before the Board, and, through your local press, under the notice of cottage-proprietors, with whom it mainly rests to adopt them, as to render a recurrence to it unnecessary on the present occasion. I cannot, however, dismiss a matter to which it is impossible to attach too much importance, without remarking, that whatever other improvements may be effected—however efficient may be your system of drainage, scavenging, and removal of nuisances—if the dwellings of your labouring poor are left in their present unventilated, and badly lighted condition, one of the most pregnant sources of unhealthiness and disease will still retain its stronghold. And urgently as additional means of ventilation and light are required in the *dwellings themselves*, other measures for ensuring a freer circulation of air *externally*, in the case of numerous confined courts and alleys, and other elose and densely populated localities, are just as imperatively called for. In all circumstances where it is practicable, there are few where it is not) the existing impediments to a (and current of air through such premises—be they walls, boarding, or what not—should be removed, and openings, as large as local arrangements permit, be thus effected in front and rear.

First, then, in relation to the *Water supply*. No town in the kingdom, probably, suffers more from the privation of water than Merthyr; though no town is more favourably situated for obtaining, in ample abundance, an element so indispensable to the health and comfort of a large population. Upon the high grounds surrounding it, the rain-fall, as we have previously observed, is considerably beyond the average, and would, at all times, furnish an ample supply to the dwellers in the valley. But its natural flow to the lower levels is intercepted, and its employment anticipated, by draining and storing in large reservoirs every available portion for the service of the Iron Works; water, as a motive power, being still extensively used in the Cyfarthfa and Plymouth establishments, and likewise—chiefly however, by conversion into steam—by the Plymouth and Penydarran companies.

Deprived of these sources, the inhabitants are dependent for their supply upon house casks—public and private wells—natural springs, which, in many instances, are mere percolations from larger bodies of water—ponds, the canal, and the Morlais Brook. Within the last three or four years, a water-cart has made its daily rounds in Dowlais, and water of good quality, procured from a pure and abundant spring, situated in the Taff Fechan Valley, distant about two miles, been sold to the people at their own habitations, at a half penny a jug, and one penny the pailful, or at the rate of about one farthing the gallon. From the eagerness with which it is purchased upon these terms, the speculation, it is said, has proved a profitable one to its originator; and practically, removes all doubt of the success of any well organized scheme for ensuring a general house supply, in ample and continuous quantity, and at a price not approaching *weekly*, to that now willingly paid *daily*, for a very inadequate and stinted allowance.

During the existing drought, (March and April) additional carts have likewise been plying a busy, and, doubtless, remunerative trade in water, in Merthyr.

Under ordinary circumstances, the great body of the labouring classes resort to the springs and spouts, or "*pishtyllion*," as they are locally called, of which there are ten in Merthyr, four in Pen-y-darran, and from six to eight in Dowlais; but many of these either entirely fail, or yield a very scanty supply, in dry weather, and during the warmer months of summer; at the very season, in fact, when it is most required. Nor does the trouble, time, and labour of procuring it, even in insufficient quantity, from the distance at which these spouts are situated in reference to many of the dwellings, entail a slight burden upon the class in question. At almost all hours of the day, from morning till night, and, even, occasionally, late in the night itself, may be seen numerous parties assembled round the spouts, waiting in turn to fill their jugs or pitchers. It is, surely, a reproachful sight to witness, day after day, week, month, and year, in a town with a population exceeding 46,000 inhabitants—these gatherings of women and children, frequently detained for hours from their families and household occupations, to secure, at so

disproportionate a cost and sacrifice, a scanty and utterly insufficient supply of water to meet their daily requirements ! The general tidiness of their dwellings—of those, at least, occupied by the Welsh—under such trying and adverse circumstances, is highly creditable to their habits of cleanliness and propriety ; and proves, incontestably, how eagerly they would avail themselves of a more adequate provision, were such a chance afforded them.

It was considerations of this kind which led me strongly to urge upon the Board the expediency of erecting *tanks* for storing the water from these sources, and by thus increasing and facilitating the supply, materially diminish a social and sanitary want of a very serious magnitude.

A *greater boon*, at a comparatively *trifling outlay*, it would be impossible for a Local Board of Health to confer upon its industrial population.

Circumstances, into which we need not enter, connected with the necessity of obtaining permission from the proprietors of the land, to erect a covered stone reservoir, (for which a sum of £12 was considerably voted by the Board) at the spout in the wall of Pen-y-darran Park—have hitherto retarded its completion. They are, however, we believe, merely of a formal and temporary nature, and the requisite leave will, in all probability, soon be granted.*

The tank will be capable of holding upwards of a 1000 gallons, and being furnished with three taps, each yielding a full stream, *three* persons, it is obvious, will be able to obtain a supply in the time that *one* only can do so now from the spout itself—nor will any water, either by day or night, run to waste.†

Means for scouring the tank will be provided, and arrangements for filtering the water, if found necessary, can readily be added. If to secure the grateful and kindly feelings of their poorer fellow townsmen, by studying to promote their comfort and well-being, be, as I am sure it must, the first consideration of the Board in the exercise of its official powers, similar re-

* Since the above was written, the tank in question has been completed, and the parties for whose use it was intended, appear fully to appreciate the benefit.

† At present, the water issues through one outlet only, placed at the end ; the flow being regulated by a simple contrivance, easily worked by the hand.

servoirs will, doubtless, be speedily put up in other localities adapted for the purpose.

But, not only is the quantity obtainable, even under favourable circumstances, and from all the sources combined, utterly inadequate to meet the demand, but the *quality* of the water, in many instances, is by no means pure or wholesome, being, for the most part, hard, and much subject to pollution. It is earnestly to be hoped, therefore, that no further difficulties will occur to interfere with the renewed efforts at present being made, to ensure to the inhabitants of Merthyr, an ample supply of pure water, by the early establishment of *Water-works*.

Where the general welfare of a large community is so deeply involved in the success of a great public undertaking, it is not, surely, too much to expect that private rights and requirements should not be insisted upon too rigourously; but, that by mutual concessions, conducted in a spirit of friendly conciliation and philanthropy, all parties will generously combine to secure the early attainment of a common blessing.

As closely connected with the water-supply, *Drainage* next claims our attention. That the want of efficient drainage is one of the most serious evils under which any community can labour, is universally admitted. And that it is the evil of all others, in connection with a very limited supply of water, and defective house ventilation, to which the large amount of sickness and mortality in Merthyr, are mainly attributable, we hold, to be equally well established.

Were proof required of the effects of *drainage alone* in checking disease, and reducing the rate of mortality, it would abundantly be found in numerous reports on the sanitary condition of several of our larger towns, and especially in those of Dr. Duncan and Dr. Holland, in reference to Liverpool and Manchester.

We are well aware how much more striking are such instances in their details, than any general allusion to their character; and the fear alone of unduly trespassing upon your patience prevents the citation.

Notwithstanding the naturally favourable position of your town, and the generally sloping character of its streets, mere *surface-channels* being the sole receptacles of all the slops and refuse of the houses, become constantly impeded and choked,

and harbour a large accumulation of filth, of the most offensive and noxious character; their defective construction, and the absence of proper care in cleansing them, augmenting the mischief. But gutters, merely intended to carry off *surface-water*, are utterly inapplicable and inappropriate, under any modification of form, or the most perfectly regulated arrangements, as the receptacles of insoluble and material filth: and when, to the stagnating mass are added *other abominations*, which, under the deplorable existing state of things, equally find their way into such channels, the climax of foulness is attained. But, you have, at length, resolved to wipe off the stigma which attaches to such a system, and, by the substitution of more orderly and befitting arrangements, to evince your appreciation of their importance and necessity. The only effective remedy for this fertile source of mischief, is, of course, a properly devised plan of sewers, with communications from the backlets, where practicable, of every house, by means of tubular trains carefully trapped. And whilst recent proceedings lead to the indulgence of an apparently well grounded expectation that the difficulties which have hitherto stood in the way of obtaining a supply of water, as the indispensable preliminary to the commencement of sewerage works, will be speedily overcome—a considerable time, even if the two be carried on simultaneously, allow me to remind you, must necessarily elapse, before they can conjointly be brought into actual operation.

In the mean while, it becomes a question well worthy of your serious consideration, what amelioration can be effected in the existing state of things, in connection with the contemplated provisions.

Considerable improvement, as we have already pointed out, and endeavoured earnestly to impress upon the Board, may, undoubtedly, be accomplished, in many of the worst conditioned districts, by the adoption of *tubular drains*; and it is most gratifying to me to add, that these suggestions having met your approval, pipes are now being laid down in several localities selected for the purpose—China, Bryant's Field, Quarry street, and Thomas street, being amongst the number.

Closely allied to Drainage, and second only in importance, is

the scavenging and general surface cleansing of roads and streets, and the removal of nuisances.

Combined, they constitute, in fact, the most efficient means within your power, of placing your town in a good sanitary position. And how much may be accomplished through such united agencies, by zealous and well directed efforts, the striking facts, which I had recently the honor of submitting to your attention, principally borrowed from Dr. Southwood Smith's admirable and most convincing pamphlet, abundantly illustrate. Its pages will amply repay a careful perusal.

But these matters, drainage and cleansing, at all times essential, acquire a peculiar and startling importance at the present critical moment. For, on the result of your deliberations, *now*—on the measures which you may adopt *now*—humanly speaking, depend under Providence, the preservation or sacrifice, the life or death, of numbers of your poorer and dependent fellow-beings.

My voice is but the feeble medium of uttering the emphatic, the solemn warning, which past and passing events stamp with a momentous significance.

Happily, the friendly note of alarm has been sounded from a higher watch-tower, commanding a wider range of observation, than our humbler position and more limited survey, allow us to embrace.

The General Board of Health, in a recent "*Notification*," invested with official weight and authority, and from its intrinsic importance, well calculated to excite attention, emphatically cautions Local Boards and Guardians of the Poor, to whom it is specially addressed, against being lulled into a false and fatal security by the present dormant character of the choleraic influence; insisting strongly, and most truthfully, that a circumstance, so likely to mislead, is in strict accordance with the history of the epidemic in the previous seasons of its visitation. The timely and able document concludes with an urgent appeal to the constituted authorities, promptly and strenuously to employ the brief interval of respite, in carrying out all those preventive measures, which experience has shown to be so efficacious in warding off or mitigating the ravages of the pestilence.

A reference to the document itself may serve to divest of impertinence our own more humble, and nearly identical representations.

For, if there be a truth in the past history of epidemic cholera clearly established—if there be a fact in the records of its fatal progress and ravages distinctly brought out—it is, we repeat, this—*cholera is the direct result of sanitary neglect*. It is an *invited*, a special, not an obtruding or indiscriminate visitant. Call it epidemic, and epidemic let it be; attribute it to atmospheric phenomena—a peculiar, magnetic, electrical, or any other condition of the atmosphere that it may please the scientific to assign—the great fact equally remains, that the choleraic influence, however engendered, is, *per se*, *comparatively harmless*. It may hover over a town, but, *unless attracted by local causes*, —elements of malaria — it passes by, a passive and innocuous wanderer, despoiled of its prey, and impotent for mischief.

Like the thunder-cloud of summer, it may lour and threaten; distant mutterings and a darkened horizon attesting its latent and destructive capabilities; but cleanliness, like the lightning-rod, neutralizes its powers, and averts the impending outbreak. We use a figure, only more clearly to embody a truth of great practical importance for your information and guidance.

I attempt not, before this Board, and in the imperfect state of our pathological knowledge, any laboured explanation of the peculiar conditions in which the choleraic, and localizing influences, respectively exist—the subtle transformations effected by their union—or the new and deadly combinations into which they enter, to generate the pestilential principle of choleraic poison. It will be sufficient for our purpose to understand that it is the noxious and congenial elements encountered in the foul, damp, and polluted atmospheres of uncleansed and filthy localities, that impart to it an activity and virulence, never witnessed under the opposite conditions of purity and cleanliness.

And knowing that such, and such only, are the circumstances under which its destructive powers are called forth, it is for you, as a Local Board of Health, to decide, whether you will passively await the impending visitation—remain inactive spectators of the forthcoming infliction—or, availing yourselves of the resources which skill and science place at your disposal, by strenuous and well directed efforts, seek to ward off or mitigate the threatened calamity.

Returning to our immediate subject, scavenging and cleansing. The question was formerly put to me by the Board—and, as a matter merely involving observation, and unconnected with personal responsibility otherwise—I admit the perfect fairness of the enquiry—“supposing the state of uncleanness in Merthyr, at the commencement of your sanitary inspection, *four months ago*, to be represented by 10; what number, do you consider, would *now* represent its position in this respect?”

And my answer was, *about 7*.—“Then,” was the rejoinder of the Board, “you are of opinion that *some* improvement has taken place, and that its extent—the degree of amelioration effected—amounts to $\frac{3}{10}$ ths, or 30 *per cent*.” And, assuming that these numbers correctly designate the relative condition of things, then, in November, and, now, in March—10, at the former, and 7, at the latter period—or, more conveniently, perhaps, 100, and 70—it necessarily follows, that the 70 degrees of dirt remain still to be removed before the healthy, the attainable, standard of cleanliness is reached. But, it does not follow, that the proportional amount realized will be, even, *maintained*, and still less, that it will be *increased*, without a *steady persistence in the employment of the same means*, which have led to the admitted result. For, the causes producing the evils in question, it must not be overlooked, are *constantly* in operation, and the effects, in their very nature, *accumulative*. Surface-gutters and cess-pools are constantly receiving house-drainage, and refuse, and filth, and are constantly liable, therefore, under existing circumstances, (the absence of underground drains and water) to become obstructed and choked.

So that, unless the operations of cleansing are, *pari passu*, followed up, fresh deposit and obstruction must take place, and the comparative cleanliness of to-day, be succeeded by positive impurity, to-morrow. To compass your object—to make an actual advance in cleanliness—either an increase in the number or efficiency of your staff in this department, are absolutely indispensable. The arrangements which you have recently made, and especially the division of the town into separate districts, for the purposes in question, are well calculated, under the vigilant supervision of your Inspector, to ensure the regular and efficient performance of these most important operations. Pounds so ex-

pended, at this critical juncture, may be the saving of hundreds, or, perchance, thousands hereafter; and contribute to the preservation of health and life, to an extent that is inappreciable.

We pass on to *Cottage Property*—the habitations of the labouring classes. Their general condition is so fully developed in the report connected with the Sanitary Inspection of the town, as to preclude the necessity of any lengthened remarks upon the *character of the buildings themselves*. The most striking features of vicious construction (and, unfortunately, they are very numerous in Merthyr) are in the instances of houses built *back-to-back*, or *under-and-over*—and of single or several habitations erected with high ground in their rear, frequently *abutting against the walls, or rising to a level with the roofs*. Others again, to the extent of whole rows, *without backlets*, or communication of any kind externally. The most unwholesome dampness, and an extremely impure atmosphere, both acting most injuriously upon the health of the unfortunate inmates, are the inevitable consequences of such ill devised erections.

Comparatively few—in fact, scarcely any—of the windows allow of being *opened at the top*, and, from their generally small size, admit a very inadequate portion of light; whilst some are altogether *fixtures*.

The serious character of these evils, and the means of correcting them, so far as this is practicable, have been carefully pointed out, in an earlier stage of my labours. Your official powers, as a Board, do not, I am aware, enable you to put in force such suggestions as might, possibly, have secured your approval. It rests with the *owners* of property, in consideration of the benefit to their tenants, voluntarily to adopt them. And, under such circumstances, judging from the past, the chances of redress, would appear to be extremely remote indeed.

It is far from my wish to speak harshly of any class, or to hold up the owners of house property to indiscriminate censure, or unqualified condemnation. But after witnessing a state of things within and around the dwellings of the poor, at variance with the ordinary comforts, and common decencies of life, and disgraceful to any civilized community, till it can be shown that

to connive at what is wrong, and to wink at what is unjust, form part of my duty, I must be excused for viewing it otherwise, and speaking the *truth* fearlessly.

It were, certainly, more easy partially to account for, than in any degree, to palliate, the existence of abuses, which a long period of passive endurance, on the one part, and a direct pecuniary interest in their perpetuation, on the other, have conjointly, in the absence of any controuling power, allowed to go on, unchecked and uninterfered with, till they have attained a height, which shocks by its very enormity. There is little fear of incurring the charge of exaggeration, where its indulgence is simply impossible. It is not difficult to understand that, in the absence of any constituted civic authority, or any "local act for paving, lighting, or cleansing," in which, till recently, Merthyr (to quote the words of Mr. Rammell), was "as destitute as the smallest rural village in the empire," every man felt at liberty to do that "which seemed right in his own eyes."

Nor can we be at any loss, in the rapid transition of the hamlet to the town, the quiet valley to the bustling community, to explain the almost unlimited demand for house accommodation by workmen and their families, and the equally unlimited and unrestrained speculation in cottage building.

Unfortunately, no one appears to have stood out from the class, and, influenced by more generous considerations, to have been solicitous, in building a house, to provide a *home*. The desire of gain, the realization of profit, would seem to have been the main, if not the sole, actuating motive, in such exertions. To expect any thing approaching to system or regularity in the distribution of buildings, under such circumstances, were out of the question—they formed no part of the calculations.

We cease to wonder at the ineligibility of sites, thus hastily appropriated, which everywhere meet the eye; and view without surprize, street after street of low, confined tenements, with roads unformed, without foot-paths, undrained, presenting a mass of mud and filth, and destitute of the slightest provision for carrying off the refuse of a teeming population; narrow, close courts, and crowded alleys, crammed into a space so nicely economized, that an entrance would seem to have been begrudged, and ingenuity to have been foiled in its further reduction!

That the arrangements of decency should have been disregarded—light and ventilation have been uncared for—and a supply of water, unprovided—were only consistent omissions where neglect was the rule, and forethought, the exception.

Let any one disposed to question the correctness of so gloomy a description, examine for himself any of the following localities—Pont-y-storehouse, the Cellars, Quarry street, Bethesda Gardens, Bryants' Field, Pwlllybaw, Caepanttywyll, Ynysgau, Caedraw, Pedwranfach, &c.

Let him go into the courts, and visit, with the fatal list in his hand, the localities in which cholera committed its ravages; and *then* say whether the picture is overcharged. And if it be correct, who is to blame for such a state of filth and wretchedness? Happily, it is not my province to apportion the exact amount of culpability attaching to the several parties implicated—the originators or the tolerators of a system, so discreditable and unjust.

Local government, we have seen, there was none; and blame therefore, rests not there.

And, surely, not upon the occupant, for he is the sufferer. And if, in some instances, the present owners of cottage property be not the original perpetrators of these abuses, their tardiness and indifference (to use no stronger terms), to aid in any present amendment, entitle them to a full share of the blame, which necessarily falls upon the class.

A strong feeling seems to exist against legislative, or, in fact, any interference, between the landlord and his tenant.

But what has necessitated such interference? What, in truth, but the wretched and neglected condition of the dwellings of the poor, led to the Public Health Act? If Local Boards step in, and insist upon improvements, landlords have only to thank themselves for the intrusion, and may feel very sure that they are not undertaken before they are required—that the absence of voluntary effort, has been the moving cause of compulsory enactment.

But there are other grounds, which not only justify, but render imperative, public interference.

The evils of such abodes are by no means confined to their inmates—they foster the spread of epidemic diseases—and the increased sickness, and heavy mortality thus occasioned, entail a

corresponding pecuniary burden upon the general body of rate-payers, who are thus taxed for individual neglect. And let not the owners of house property forget, for how long a series of years they have been receiving high, and in many instances, exorbitant rents, from these undrained, unpaved, uncleansed, and too frequently, unrepaired and ruinous, habitations. That it is only *now*, after the realization of profits which should have induced more liberal arrangements, that they are called upon to do tardy justice to the labouring poor, and to make some reparation for long withheld rights.

Let me not be misunderstood. In speaking of the owners of cottage property, I speak of them generally as a class—not of individuals, but of the collective body. And, as a class, from their peculiar position in relation to the poor, I would beg to remind them that they have much in their power—that they possess the means of directly and indirectly effecting a large amount of good—of conferring substantial benefits and blessings upon their more dependent fellow creatures. And it is, surely, not too much to expect, from members of a social community, thus circumstanced, that they should, in their sphere, contribute its general well-being and prosperity.

And in the case of the labouring population of your own town, (and the remark is not made without ample opportunity of testing its correctness) there is every encouragement and inducement thus to befriend and assist them. With rare exceptions, the interiors of the cottages of the Welsh—your own countrymen and women—are distinguished by extreme cleanliness, well ordered arrangements, furniture, which is, obviously, their pride, and scrupulous neatness and propriety.

A druggist in Merthyr assured your Inspector, that he paid his shop-rent by the sale of "*furniture paste*;" and, from the brightness of the drawers and tables, the statement may well be credited.

The contrary is sometimes asserted of the poor; and they are represented—unfairly, in my opinion—as "wedded to dirt." And, certainly, their contact and acquaintance with it, externally to their dwellings, is sufficiently close and familiar to countenance the notion. At all events, the statement is inapplicable to the labouring class of Merthyr—the Irish portion excepted.

I have been led to dwell the longer upon this subject, from its important bearing in the social system, and the difficulty of dealing with the serious evils it involves, without the co-operation and assistance of cottage proprietors. The public mind is rapidly awakening to the necessity of providing better accommodation—houses more approaching to *homes*—for the working population. The conviction is daily gaining ground that, if any great moral change is to be effected in their habits, and they are to be weaned from low and debasing sensual indulgences—if the beer-house is to be abandoned, and scenes of dissipation and profligacy relinquished—if the heavy, and yearly increasing, calendar of sin and crime is to be diminished—the *first step* in amelioration must be directed to the *improvement of the sanitary and social condition of the masses*. Notions of decency and self respect stand little chance of being inculcated amidst filth and dirt—and all attempts at secular and religious instruction will be comparatively profitless, where discomfort and discontent indispose to their reception.

Efforts have not been wanting on the part of government, or the general community, to extend the blessings of sound and enlightened education. At no period in the history of this country, were so large a portion of its population under moral and religious training—and, at no period in its history, it is painful and humiliating to add, do the records of its criminal courts present a larger amount of vice and depravity. The form of crime may have changed; it may be less atrocious and startling, possibly, in its character—the additional checks imposed upon its commission, and the greater certainty of detection, being not without their restraining influence. But crime itself, despite the advance of education, is on the increase.

There must be rottenness in the social system, somewhere, under which such incongruous conditions are exhibited. One fact, pregnant with significance, points to the plague spot—the *worst conditioned districts* furnish the *largest number of offenders*.

We have, thus, another and most formidable evil to add to the results of sanitary neglect, and well calculated, from its disastrous and widely spreading consequences—for, moral, like mortal malady is contagious—powerfully to stimulate our efforts in the great work before us.

But, it would be unjust to restrict our view to the darker side of the picture ; and we gladly turn to the more cheering prospect which progressive improvements are opening out to our notice.

Many parts of the town, under the judicious arrangements of the Local Board, are beginning to assume a marked, and greatly improved character, and contrast favourably with the neglected appearance they presented at an earlier period of inspection.

Several streets, which, a few months ago, might have been cited in apt illustration of neglect in its worst features—accumulations of mud and filth rendering them almost impassable—have been formed and metalled—foot-pavements laid down—surface-channels constructed—and, in some instances, pipe-drainage added. In many of the courts, similar improvements have been carried out ; leaving the occupants without excuse for subsequent defilement. Nuisances have been extensively removed—and deposits of ashes and refuse very manifestly diminished. And, as regards the town generally, greater cleanliness and decency are every where apparent. Drainage, upon a larger scale, and in anticipation of the general scheme, has likewise been commenced in one or more localities.

These are sanitary operations which cannot fail to confer important benefits upon the several districts in which they have been effected ; and are, we trust, only preliminary to further and more extended proceedings.

In drawing this too lengthened address to a close, which I cannot do without tendering you my best thanks for the patient and indulgent attention with which you have listened to its details, and gratefully acknowledging my obligations to Professional friends for much valuable information—I am very sensible, believe me, of the imperfect manner in which the important charge entrusted to me has been fulfilled. But, however inferior the talent, and feeble the advocacy, brought to the task, lack of zeal or fidelity in its prosecution, so far as humble abilities might avail, are not among the shortcomings with which my own conscience will upbraid me, or which you, I trust, will be inclined to lay at my door.

If I have spoken strongly, I have done so in all honesty. If I

have pleaded earnestly, it has been from conviction; and whatever course you may deem it right to pursue, you will not reproach your temporary Officer of Health with concealing your true position, or withholding suggestions for its improvement.

The score, let me remind you, stands at 70; and it is in your power yet greatly to reduce it.

And the infallible test, the unerring criterion of its increase or diminution, will be the greater or less amount of sickness and mortality among your labouring population. A surplussage of disease and death will continue to be chronicled in your local records—and a lighter or heavier state of the mortal and moral calendar to witness for or against you—stern monitors of duty—in exact proportion to the sanitary improvement or degeneration of your social community.

The great tide of human life flows and ebbs in accordance with physical laws regulating the vast ocean of existence. And we may as vainly hope, in breaking down the barriers to its inroad, to limit the desolating effects of the overwhelming wave, as to resist the fatal ravages of disease, when the safeguards against its incursion are destroyed or withdrawn. The solid embankment, in the one case, is not a surer protection against the encroaching flood of waters, than the bulwark of cleanliness and purity in restraining the outbreak of pestilence, in the other.

POSTSCRIPT.

While these pages have been passing through the press, Cholera has again, for the *third* time, visited Merthyr; though, fortunately, at so advanced a season of the year (September, October and November), as considerably to limit the extent of its ravages, and abridge the period of its duration. The recent outbreak commenced, in fact, in the very month in which that of 1849 terminated.

Nor have the judicious measures adopted by the Local Board, at the suggestion, and with the zealous co-operation, of your Medical Faculty, been without their effect in conducing to the same happily mitigated results. Notwithstanding, however,

your well directed labours, and a favouring season, the loss of life has been sufficiently great to leave little ground for gratulation, and much for anxious enquiry.

An elevation of from 500 to 1,200 feet above the sea forms in itself a protective feature ordinarily conferring a degree of immunity not enjoyed by towns occupying the lower levels.

How greatly superior, for instance, in this respect, the position of Merthyr to that of Cardiff. A Postscript precludes our following up the comparison; or it would not be difficult to point out other important local advantages, c. g. the sloping character of the ground, its geological formation, &c., not possessed by your rapidly increasing neighbour. How, then, are we to reconcile, within the space of a few weeks, the sacrifice of 424 lives? The opinions of the writer, expressed without any disguise, are before you in the preceding pages. Let us turn, for a moment, to those set forth at the close of the former visitation, by your observant fellow-townsmen, Mr. Dyke. Having named the localities in which the epidemic "almost simultaneously broke out in 1849," he adds, "these places are about the *dirtiest in the town*."

"In its progress," he further remarks, "it seemed especially to select persons residing in *courts and alleys*, and those who occupied *double houses*." The "aggravation of the sufferings of the poor," at that period, is, moreover, attributed to "the want of an adequate supply of water." "I believe," observes Mr. Dyke, "that if the town had had a sufficient supply of water adequately to cleanse the courts, gutters, &c., the virulence of the epidemic would have been materially diminished." Thus concisely stated, were some of the causes to which the severity of cholera was ascribed, just five years ago, on this very day, December the 22nd, on which we are now writing. And, if called upon to respond to a similar enquiry *now*, must not the answer—not mine, but Mr. Dyke's—be the same? Dirt, the inefficient supply of water, and the absence of ventilation. Have not the localities notoriously the worst in sanitary condition—"the dirtiest in the town"—furnished the largest proportion of victims? And, despite the emphatic statement that "*double houses*" were especially liable to be attacked, even when their occupants were

“persons of cleanly habits,” and “well supplied with food”—have you not unscrupulously added to their number, and built dwellings back-to-back, and under-and-over, just as recklessly as though the warning had never been uttered?

And if the supply of water was *then*, in 1849, pronounced to be “inadequate,” and the sufferings of the poor aggravated by the want of it—how much more so must this be the case *now*, with an addition, probably, of from 5 to 6,000 to your population? And if all this be true—(and who more cognizant of the facts than yourselves as members of a Local Board of Health?) if the ventilation and internal arrangements of cottage-dwellings, of your crowded courts and alleys, be just as defective *now* as they were five years ago—what need for a stranger to raise his voice, and to embitter self conviction by the language of impertinent expostulation?

But we feel that it is hardly right to arrive thus summarily at conclusions, or to take advantage of assumptions, recognized though they be as facts, in the one case, while a different course—their establishment by direct evidence—was pursued in the other.

Availing myself of the courtesy of professional friends, who in the most liberal manner met my enquiries upon the subject, I proceed, therefore, to verify these statements, and to prove most indisputably, with what fatally aggravated effect the late visitation acted in *close* and *unventilated* habitations.

Before, however, proceeding with this testimony, it may be well to have lists before us of the localities in which the fatal cases of Cholera occurred; by which the reader, conversant with their character, will be able to judge for himself how far their sanitary condition was concerned in the production of such a result. There are three lists, it will be observed, presenting the deaths in the Upper and Lower Divisions of the town—Numbers 1 & 2 containing two columns; the first column being the record of the mortality from the epidemic of 1849, as given by Mr. Rammell at the close of his report in that year; and the second, kindly supplied by the Superintendent Registrars of the respective Districts, through Mr. Davies, that which occurred from the recent visitation. For purposes of comparison, the arrangement of the localities in the latter has been assimilated to that of the year 1849.

DEATHS REGISTERED FROM CHOLERA AND DIARRHEA.

FROM MAY TO SEPTEMBER, 1849—AND FROM SEPTEMBER TO NOVEMBER, 1854.

TABLE I.

MERTHYR LOWER, Population 23,147.

	1849.	1854.
Abercanaid	5	3
Angel street	1	0
Bridge street	10	1
Caedraw	63	30
Court street	6	0
Collier's Row	2	0
Danderi	1	0
Dyffryn & Pentrebach..	20	7
Gellydeg	2	0
Georgetown and Ynysfach.	87	22
Gillor street	3	0
Glebeland	32	12
Heolgerrig	4	3
High street	7	3
Market Field	21	3
Mill street	0	3
Mount Pleasant Farm ...	1	0
Pedwaranfach	17	15
Penheol Ferthyr, & Pwll- yrhwyad	6	4
Penwaunfawr	8	0
Penydarran Yard	8	0
Plymouth street	32	10
Pontmorlais	29	8
Pontyrhyn and Troedyrhiw	5	2
Twynyrodyn and Tramroad side, &c.	61	10
Ynysgau	32	7
Waunwyllt	2	0
Rhydycear	5	1
Totals....	470	144

TABLE II.

MERTHYR UPPER, Population 23,231.

	1849.	1854.
MERTHYR.—Bryant's Field	17	7
„ Caepanttywyll .	38	4
„ Grawen Terrace	19	3
„ Pontmorlais ..	1	2
„ Pontystorehouse	73	26
„ Quarry Row ..	43	10
„ Tydfil's Well ..	76	3
PENYDARRAN	191	31
DOWLAIS	504	194
Totals....	962	280

TABLE III.

MERTHYR UPPER, Population 23,231.

	1854.
MERTHYR.—Bryant's Field, &c.	7
„ Caepanttywyll....	4
„ Grawen Terrace ..	3
„ Pontmorlais	2
„ Pontystorehouse ..	26
„ Quarry Row	10
„ Tydfil's Well	3
	— 55
PENYDARRAN	30
„ Gellyfailog (South)	1
	— 31
DOWLAIS.—Atkins's Court ..	7
„ Berry Square	1
„ Bethania street....	3
„ Blue Boar street ..	3
„ Cac Harris	9
„ Chapel street	1
„ David street	4
„ East street	1
„ Gellifailog (North)..	10
„ Graig cwm Morlais	1
„ Gwern llwyn bach..	7
„ High street	10
„ Horse street	4
„ Irish Row	5
„ Ivor street	14
„ Ivor Town	1
„ Jarrett's Houses ..	1
„ Lower Brecon street	9
„ Market Place	1
„ New South Wales..	16
„ Plough, (back of) ..	9
„ Sand street	4
„ Top of Dowlais	28
„ Twenty Houses....	9
„ Union street	2
„ Upper Brecon street	11
„ Vaughan's Field ..	6
„ Well street	8
„ Wind street	9
Total in Dowlais	—194
	—
Total....	280

It must be borne in mind, in examining these Tables, that the deaths from cholera in 1849 were $(470+962)$ 1432, and in 1854, $(144+280)$ 424; and, consequently, that in estimating the proportional mortality of the two periods from the figures placed opposite each locality, reference must be had to the respective totals.

It is not contended that in *every instance* an equal ratio of mortality is strictly observable; inasmuch as a marked feature characterising the later visitation was its more general *dispersion*. But, viewing the same localities in the two columns together as a whole, we think it will be seen that there is a decidedly close approximation; in other words, that in the same localities in which the deaths were numerous in 1849, they were *relatively* so in 1854.

In 1849, 1,432 fatal cases occurred in the parish; 962 in Upper, and 470 in Lower Merthyr. In 1854, 424; 280 in the Upper, and 144 in the Lower Division. At each visitation, the deaths, it will be observed, in Upper, were *double* those in Lower Merthyr—and that the total number of deaths in 1854, was *two-sevenths* of the total number in 1849; $(1432 \div 7 = 204.57)$ and the two Divisions being halves of each other, this proportion, of course, equally applies to them. Let us test the principal localities by this standard.

(Upper Merthyr)—In the whole of Dowlais, there were 504 deaths in 1849, and 194 in 1854; which considerably *exceed* the above general proportion, being in that of *two-fifths* or 50 beyond the average. In Bryant's Field, 17 & 7; likewise *two-fifths*. In Pontystorehouse, 73, and 26; *two-sixths*. In Quarry Row, 43, & 10; nearly *two-sevenths*.

(Lower Merthyr)—In Caedraw, 63 & 30; being nearly in the large ratio of *one-half*. In Dyffryn and Pentrebach, 19 & 7; nearly *two-fifths*. In Georgetown and Ynysfach, 87 & 22; nearly *two-sevenths*. Glebeland, 31 & 12; more than *two-sixths*. High street, 7 & 3; nearly *two-fifths*. Pcdvaranfach, 17 & 15; nearly *equal*. Plymouth street (south of the Toll-Gate), 32 & 10; exceeding *two-sevenths*. Pontmorlais, 29 & 8; *two-sevenths*. Ynysgau, 32 & 7; nearly *two-eighths* or *one-fourth*. These figures embrace 238 of the 280 fatal cases of Cholera which occurred in the Upper, & 114 of the 144 fatal cases which occurred in the Lower Division of the Parish, in 1854. In the same localities, the deaths, in 1849, were respectively 637 & 317; *two-sevenths* of 637 are 182; consequently, the difference between this number and 238, viz. 56, gives the *relative* excess of deaths in 1854, in Upper Merthyr; *two-sevenths* of 317 are 90; which, in like manner, subtracted from 114, leaves 24 as representing a similar excess, in the Lower Division.

Instead, therefore, of an average ratio for all the localities, of *two-sevenths*, the fatal cases, in those above named, were respectively in the proportion of *two-fifths* and *two-sixths*; thus the more strongly bearing out the remark, that the localities in which the majority of deaths occurred in 1849, and in 1854, were identical: and that such localities were, and are, amongst the worst sanitary conditioned in the town, we proceed to show.

"The attacks and mortality," writes Mr. White, "were confined in a *marvellous manner* to those who lived in houses where there was no "*through*" ventilation; that is, no back-yards—houses in courts—cellar houses—and houses built back-to-back, especially." "I am sure," he continues, "I am speaking in bounds when I say, that *five-sixths* of the fatal cases were in houses of this sort." And, as though struck himself with the preponderating fatality which characterized the disease under such circumstances, and readily allowing for the incredulity of others not eye-witnesses of the fact, Mr. White immediately adds—"If you like to go into this matter, I will show you, or any one deputed by you, *every house in which a death occurred*; which, I am sure, will more than bear me out in this remark."

To the same effect is the testimony of Mr Probert in reference to his district, situated at the other extremity of the town. "The greater number of habitations in which cases of cholera took place are ill provided with proper means for efficient ventilation; and moreover, the majority of these dwellings are situated in the worst localities as regards sanitary provisions of water, drainage, &c." "Pray urge upon the Board of Health," subjoins Mr. Probert in a postscript, "the necessity of providing all cottages with *efficient means of ventilation* (back-doors and windows, &c.) No sanitary improvements will be attended with satisfactory results without attention to this important means of purifying the air within cottage-dwellings."

Upon turning to page 59 of this report, it will be seen that this important suggestion of Mr. Probert, penned on the 18th January 1855, had been anticipated by the writer, and in terms so nearly similar to those employed by his correspondent, as almost to countenance the idea of their having been added in compliance with such request—They were, however, *in print* several weeks previously.

The passage alluded to—and, as conveying, at least, a perfect agreement in opinion, its quotation will be pardoned—is the following—"I cannot, however, dismiss a matter to which it is impossible to attach too much importance, without remarking that, whatever other improvements may be effected—however efficient may be your systems of drainage, scavenging, and re-

removal of nuisances—if the dwellings of your labouring poor are left in their present *unventilated and badly lighted condition*—one of the most pregnant sources of unhealthiness and disease will still retain its stronghold.”

Mr. John Russell, in like manner, attributes “the greater predisposition to attack, and malignancy of cholera, to *unventilated dwellings, in connection with other sanitary evils.*” Some cases, in particular, the course of which was unusually virulent and rapid, he ascribes to the “very confined and bad sanitary condition of the localities, and the *ill ventilated state of the dwellings.*”

“Of all diseases,” writes Mr. Dyke, “I think cholera the most easily *prevented*; for it arises only where there is *that filth* which common decency and common sense equally instruct men to remove from the neighbourhood of their habitations.”

Strikingly corroborative of this now generally admitted truth, is the following additional statement of Mr. White—“It was the houses above “twenty houses,” which we call, Top of Dowlais, that were chiefly attacked; and they are nearly all of the kind I have before alluded to—that is, have no *through ventilation*. Another feature which you should keep in view is, that it is the only part of Dowlais where the *scavenging carts have not been accustomed to go*; and where the old system of throwing the *ashes and refuse of all kinds down near the doors* has been retained in all its primitive barbarity.”

Such is the unvarying and independent testimony of your local Faculty; and evidence more uniform or conclusive it would, surely, be difficult to adduce. Do not such statements on the part of observant and “skilled witnesses” abundantly justify and confirm the strongest representations made in the preceding pages? And so long as a state of things, so deplorable and disgraceful, is allowed to continue, may you calculate with unerring certainty upon a periodical return of a like calamitous visitation. Instead of repelling, you invite, by such culpable neglect, a renewal of the affliction. And judging from the past history of the epidemic, the season of its recurrence, in all human probability, is not far distant. The first outbreak of cholera in Merthyr, which commenced early in the month of October, and continued till the middle of December, 1832, let me remind you, reappeared in the spring of 1833. Be the event, however, what it may, as regards the approaching warmer season—to prepare for its recurrence, to set your houses in order, and strenuously to carry out every preventive means in your power, are duties which self-interest and sound policy alike urgently dictate.

And the same measures by which the more formidable pestilence may be averted, are equally antagonistic to that large class of Epidemic diseases, which, if less directly malignant in their

nature, are far more destructive of human life, from their constant and more general prevalence.

Your printer warns me that further matter will inconveniently trench upon the space reserved for the appendix. Professional friends, (and to Mr. Dyke, for his valuable analysis of all the cases of cholera, 51 in number, which he personally attended, my acknowledgments are specially due) will, therefore, I trust, pardon me for not making a more extended use of the valuable materials which they so liberally placed at my disposal.

Their suppression, they will readily believe me, arises from any thing but a due appreciation of their practical importance.

I cannot close my temporary sanitary labours in connection with the town of Merthyr Tydfil, without expressing my deep sense of the unvarying kindness and consideration with which my humble services have been honoured—the generous spirit in which strong (and to be honest they could not be otherwise) representations have been received by the Local Board—and the courteous personal attentions I have experienced from one and all, and which rendered my sojourn amongst you a period to which I shall ever recur with feelings of the liveliest interest and pleasure. Add yet one more to the heavy obligations already incurred, and you make me your grateful debtor to an extent which no terms can adequately convey. Give to every family and household of your industrial population the inestimable benefit, which well regulated sanitary arrangements can alone supply, of a *comfortable and healthy home*—and, while you bestow upon them a boon, second only and preparatory to the higher blessings of morality and religion, you confer upon my humble labours a reward beyond measure the most gratifying that my utmost ambition could desire.

Clifton, February 7th, 1855.

W. K.

